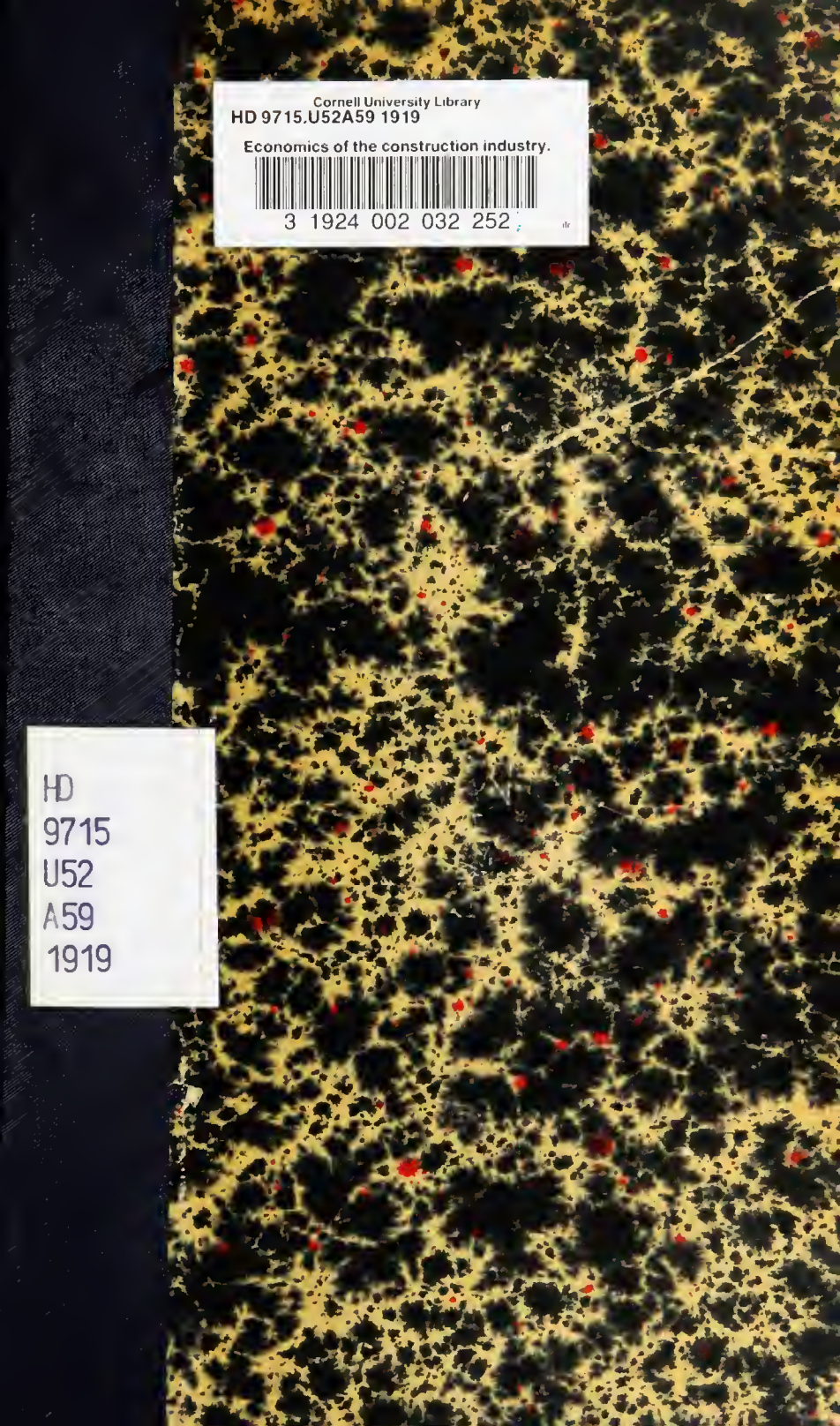

U. S. DEPARTMENT OF LABOR
INFORMATION AND EDUCATION SERVICE
DIVISION OF PUBLIC WORKS AND CONSTRUCTION DEVELOPMENT

ECONOMICS

OF THE

CONSTRUCTION INDUSTRY

WASHINGTON
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WILLIAM B. WILSON,
Secretary of Labor.
ROGER W. BABSON,
Director General Information and Education Service.
FRANKLIN T. MILLER,
Director Division of Public Works and Construction Development.

CONTENTS.

LIST OF CHARTS.

LETTERS OF TRANSMITTAL.

U. S. Department of Labor,
Information and Education Service,
Washington, June 24, 1919.

Sir: Immediately after the armistice was signed, you asked me to do what was possible to prepare the country for the readjustment period and see that work was provided for the returning soldiers. You asked if this organization, which had been directing its energy to getting the country from a peace to a war basis, could not be also used for getting the country from a war to a peace basis.

I immediately took the matter up with my associate, Mr. Ernest T. Gundlach, and my assistants. It was decided to organize a Division of Public Works and Construction Development and make Mr. Franklin T. Miller director thereof. Mr. Miller since early in August had been serving us in connection with some important work. His knowledge of the Department of Labor, combined with his other special qualifications, made him an ideal man for this task.

The building industry was the one great industry in the country which offered the greatest opportunities for expansion, it having been the one industry which had been especially suppressed during the war. Moreover, the building of homes adds both to the permanent wealth of the country and also has certain social features which are of inestimable value. I remember that you yourself once said: "A man was never known to hang the red flag of anarchy over his own hearthstone."

Of course the Information and Education Service does not take the credit of reviving industry and bringing about the remarkably smooth change from war to peace work which the Nation has witnessed. Many individuals and organizations had a part in this great effort and the credit belongs to all jointly. I do, however, Mr. Secretary, feel that the greatest share of this belongs to you and the Department of Labor. As you were the greatest means in interesting labor in the war and keeping the boys at the front supplied with food, clothing, and ammunition, so you were likewise the greatest factor in the readjustment period following, supplying work for the boys upon their return.

The work has now been completed and we are to-day closing up the service. In connection with this work we have, however, collected some most valuable data which should be of great use in

years to come to all interested in the building of public works and construction generally. This data has been collaborated and put in permanent form by Mr. Miller and his assistants, Dr. M. A. Mikkelsen, Dr. E. J. Clapp, Dr. John Whyte, Mr. T. S. Holden, and others. It is this data which I herewith submit to you as the last act of the Information and Education Service. I believe that the book should be in the hands of every Federal, State, municipal, and town official who has in contemplation any public work, as well as in the hands of all architects, builders, and others interested in construction development.

I also take this occasion of thanking you for the privilege of working with the department during the past year. You have given me the pleasantest year of my life, for I have been able to feel that it has been a year of usefulness. Furthermore I have learned much from you the value of which I can never overestimate.

Let me also add my acknowledgments to Mr. Ernest T. Gundlach, Mr. George W. Coleman, Dr. Davis R. Dewey, Mr. Frank T. Hawley, Mrs. Clara Sears Taylor, and Mr. Robert C. Starr, who has most efficiently served as chief clerk, and all division chiefs, assistants, clerks, and others who have been connected with the work. If it is not out of place, I should like also to take this opportunity of thanking Mr. H. L. Kerwin, Director of Conciliation, and Mr. Edward S. McGraw, your private secretary, and the other men in your office; also your most efficient chief clerk, Mr. Samuel J. Gompers, and Mr. H. A. Works, Chief of the Division of Publications and Supplies, to all of whom I am under the deepest obligations for aid in the publication of this volume.

Respectfully, yours,

ROGER W. BABSON,
Director General.

Hon. W. B. WILSON,
Secretary of Labor, Washington, D. C.

U. S. DEPARTMENT OF LABOR,
INFORMATION AND EDUCATION SERVICE,
Washington, June 30, 1919.

SIR: In accordance with a letter of instruction from the Secretary of Labor, the Division of Public Works and Construction Development was organized December 30, 1918, in the Information and Education Service of the War Labor Administration of the Department of Labor.

The function of the Information and Education Service had been to facilitate by means of educational publicity the transfer of labor and industry from peace to war production. When the armistice

was signed and hostilities ceased, it clearly became the duty of the Information and Education Service to employ its means of publicity toward a restoration of labor and industry to a peace footing.

Of the larger industries of the country the one which had been most severely curtailed was the construction industry, embracing public work and private building. Its prompt return to a condition of activity was a matter of public interest (1) in order to ameliorate the shortage of housing and of other private buildings, which was causing high rents and affecting the cost of living and of production; (2) in order to supply the deficiency in schools, hospitals, roads, water supplies, local transit, and other public and semipublic utilities, the construction of which and, in many cases, the repair of which had been wholly or partly discontinued during the war; (3) in order to furnish employment to demobilized soldiers and industrial workers during the period of readjustment of the manufacturing industries.

The Secretary of Labor, therefore, in his letter of December 20, 1918, directed that particular effort be made through educational publicity to facilitate the rehabilitation of the construction industry or, in the phrase of the letter, "to stimulate the interest of the Nation in public and private construction"; and authorized the formation of the Division of Public Works and Construction Development for this purpose.

Through the cooperation of the Writers', Speakers', Posters', and Industrial Plants Divisions, already in existence as units of the Information and Education Service, the new division was assured a staff of men and women experienced in the methods of popular education, and it was necessary for the new division but to supplement the Writers' Section and to organize Correspondence "Own-Your-Own-Home" and Economics Sections.

So that the work of education undertaken by the division might be sound, complete, and of substantial value to the country, it was decided to investigate the economic conditions affecting the construction industry. The investigation was intrusted to the Economics Section, created for the purpose and containing the following personnel: Edwin J. Clapp (Ph. D., formerly professor of economics in New York University) and Michael A. Mikkelsen (Ph. D., editor of the Architectural Record), associate directors; Warren Case (civil engineer), Everett Dominick (A. B.), Thomas S. Holden (architect), Augustus P. Norton (A. M.), Catherine J. Paine (A. M.), L. A. Rufener (Ph. D.), and John Whyte (Ph. D.), staff members. The various phases of the investigation of the staff of the Economics Section were supplemented and checked by competent specialists.

From the investigation by the Economics Section it became apparent that the general commodity price level as it stood four

months after the armistice could not be expected to recede much, if at all, in the near future; that the rise in the "cost of construction" was fully 20 per cent less than the rise in the general commodity price level; and that there had practically been no advance whatever in urban land values.

As soon as these findings, with the evidence supporting them, were made known the chief obstacle to a prompt revival of the construction industry, namely, the expectation of an impending fall in prices and wages, was removed; and construction activity rose in April to proportions comparable with the record for corresponding prewar months, and has since continued to rise.

However, the present volume of construction is not sufficient to remedy the acute shortage of housing which has been brought about by more than four years of subnormal building. A large part of it consists of the smaller classes and of remodeling work on existing, long neglected buildings; and in spite of relatively large expenditures in the construction industry, it may be doubted whether the provision of new buildings this year will be adequate even to care for the current annual growth in population and industry.

The required provision of new buildings is prevented by insufficiency of money available for real-estate loans. The investigation by the Economics Section brought out the disquieting fact that the growth in resources of those savings and investment institutions which lend money on real estate has not kept pace either with the growth in resources of commercial banks or with the increase in national wealth. Furthermore, a large proportion of the resources of those savings and investment institutions which lend money on real estate has become fixed in Government securities.

Insufficiency of mortgage-loan capital is without doubt the chief present obstacle to elimination of the housing shortage. This insufficiency might be temporarily overcome by the exemption of limited amounts of mortgage loans from income taxation.

The danger that the shortage may be continued, if not, indeed, increased, induces me to recommend that a congressional committee be requested to investigate fully the causes of the insufficiency of mortgage loan capital to meet the country's need for new buildings and to devise remedial legislation.

Meanwhile, in order that a partial remedy might be at once available, the Division of Public Works and Construction Development has cooperated with the legislative committee of the United States League of Local Building and Loan Associations in preparing the home-loan bank bill introduced in the Senate by Senator Calder. The building and loan associations are an important factor in the construction of small homes; and the facilities for rediscounting

mortgages which they ask for in the home-loan bank bill would greatly advance the cause promoted by the Own-Your-Own-Home Section of the Division of Public Works and Construction Development. A more immediate though partial remedy would be the exemption from income tax of the interest received from real estate mortgages within proper limitations as to interest bearing rate of the mortgages and as to amounts for which exemption might be allowed to each individual.

I beg leave to transmit herewith the report of the Economics Section and to recommend its publication.

Yours, very truly,

F. T. MILLER,
Director, Division of Public Works and Construction Development.

ROGER W. BABSON,
Director General, Information and Education Service,
U. S. Department of Labor, Washington, D. C.

ECONOMICS OF THE CONSTRUCTION INDUSTRY.

I. SUMMARY.

PURPOSE OF INVESTIGATION.

The instructions received by the Economics Section called for an investigation of those general economic factors which, taken together, determine the financial success or failure of a prospective investment in improved real estate and which, consequently, investors are in the habit of considering before undertaking the improvement of real estate. The division was organized to "stimulate the interest of the Nation in public and private construction" with a view to the creation of buffer employment for labor during the period of transition of manufacturing industries from war to peace production. It was feasible and proper to stimulate interest in public construction on other grounds than financial profit; but as the responsibility for providing buffer employment was a responsibility of society as a whole, it was felt that the individual investor should not be urged to build except in obedience to normal private considerations. These differ somewhat according to the type of construction contemplated, but the most important is financial profit. It was decided, therefore, that stimulation of private construction should take the form of supplying authentic data to assist the individual investor to judge for himself whether or not it would be profitable for him to build.

SCOPE AND METHODS.

The provision of such data meant an investigation of the volume of deferred construction, of the recent course of construction-material prices, of wages in the construction industry, of land values and rents, and of mortgage-loan conditions. As the financial soundness of a present investment in improved real estate depends upon future earnings, an investigation of the economic factors just mentioned would have no practical value unless it revealed future tendencies. It was necessary therefore to compare prices and wages in the construction industry with prices and wages in general industry in order to show whether the former were relatively high or low, and hence likely to recede or advance in the process of adjustment to the general price level. It was necessary, further, to identify the principal causes of the rise in prices and wages during the war in order to balance

those that were purely temporary against those that in the altered economic conditions brought about by the war must be permanent or semipermanent.

The investigation, while covering a rather wide field, required neither minute nor exacting research. It was extensive rather than intensive, designed to meet a definite trade demand for the latest information of a kind which the trade habitually uses. Most of the desired information, principally of a statistical nature, was already in existence, collected by departments and bureaus of the Government but not selected and compiled for our special purpose; and the rest was obtainable through questionnaires. Recognizing the urgent nature of the investigation by this section, the various Government departments and bureaus rendered assistance freely, in not a few instances permitting transcripts to be made of statistics and reports awaiting publication. This section, in turn, promptly released for publicity by the division all information of value which it received.

The chief difficulty connected with the investigation was the short time available. If it was to serve the purpose set for it, the essentials of the investigation would have to be finished in two months, by the 1st of March. This was accomplished, and the present report is substantially a collection of papers, extended and amplified, which were used as sources for publicity by the division before March 1, 1919.

In the course of the investigation, it became apparent that the principal cause of the rise in prices since the beginning of the war in Europe, and particularly since the entry of the United States into the war, is the depreciation which has taken place in the value of money, and that this depreciation is relatively permanent. The high cost of everything, all over the world, is primarily a monetary phenomenon. As to this matter, the opinion of Prof. Irving Fisher was sought; and and upon request Prof. Fisher supplemented his oral confirmation with a paper entitled "The New Price Revolution," which pointed out the war changes in the circulating media of this and other countries, explained their effect upon the price levels here and abroad, and declared his conviction that the general level of prices as it stood on March 1, 1919, "is not going to fall much, if at all" (The price levels reached upward in March and continued to advance up to July 1, 1919, when this report went to press.) A higher price level of course means a higher wage level, because it means a higher cost of living.

Prof. Fisher's paper was ready for release on March 3, 1919, and owing to the great weight of his authority on prices, the daily newspapers and trade papers gave wide publicity to the substance of his statement. Within six weeks the division had sent out 200,000 copies of this paper, mostly in response to requests by bankers, manufacturers, and business men who had seen reference to it and who wished to distribute it among their customers. Prof. Fisher's mono-

graph has done much to dissipate fallacies as to the temporary nature of the present price level.

FINDINGS.

The more important findings of the investigation are the following:

1. As to deferred construction.

A questionnaire relating to projects for which plans had been drawn but for which contracts had not been let prior to the armistice was sent out in January to 15,000 architects, engineers, public officials, and others. The replies disclosed 6,472 deferred projects, estimated to cost $1,711,802,000, divided into 3,378 projects, valued at $481,062,000, for private owners, and 3,094 projects, valued at $1,230,740,000, for political and public-utilities corporations.

2. As to recent construction.

The most complete construction statistics available cover contracts let for engineering and building construction north of the Ohio and east of the Missouri, together with some adjacent area, containing four-sevenths of the population of the country.

The contracts let in the first six months of 1919, compared with 1915 and 1916, run as follows:

	1919	1915[a]	1916[a]
January	$51,000,000	$70,000,000	$87,000,000
February	95,000,000	79,000,000	92,000,000
March	110,000,000	122,600,000	131,000,000
April	192,000,000	124,000,000	140,000,000
May	245,000,000	125,000,000	182,000,000
June	299,000,000	149,000,000	195,000,000

[a] Costs brought up to 1919 price level.

3. As to prices of construction materials.

In April, 1919, the index number of construction materials, including steel, was 98 per cent higher than in the year ended June 30, 1914; excluding steel, it was 84 per cent higher.

The index number for commodities in general was 10 per cent higher in April, 1919, than in the year preceding the war.

That is, building-materials prices have risen less rapidly than the general price level. If the price level stays up, the cost of building materials can not well fall.

4. As to wages in the construction industry.

The index number for union wage scales in 41 leading cities shows an advance of 28.5 per cent since 1914. This percentage of advance is less than the percentage of advance in the cost of living or in wages in certain other industries.

That is, if the cost of living and the general wage scale stay up, the cost of building-construction labor can not well fall.

5. As to cost of construction.

The increase in the cost of construction varies with the type of project. It is somewhat more than 80 per cent for a high-grade steel skeleton office building and somewhat less than 50 per cent for dwelling houses and other buildings in which the metals group of materials is not so largely represented. It should be noted that neither of these increases is so great as the increase in prices in general, as indicated by commodity index numbers.

6. As to land values and rents.

A questionnaire sent out in December brought replies from real estate boards in 91 cities. In 52 of the cities rents of residence housing (private dwellings, apartments, tenements) had advanced 10 per cent or more, in some instances 40 per cent to 50 per cent.

Advances in rents of other kinds of property were unimportant.

The market values of house sites had declined in six cities and had remained practically stationary in 72.

Later information on rents and land values was sought through a questionnaire sent to 150 real estate boards throughout the country. Replies to this questionnaire were not returned in time to be of use in this report.

In general, it appears that rents, which have risen less rapidly than construction costs, are continuing to rise because of shortage of buildings.

7. As to mortgage loans.

The main sources of real estate loans are savings banks, insurance companies, and building and loan associations. Savings banks, insurance companies, and building and loan associations have not grown so rapidly in resources as banks, other than savings banks, since 1913.

The country's finances are well organized to serve (*a*) commercial needs, by commercial loans, the process being facilitated by the rediscount privileges of the Federal Reserve banks; and (*b*) long-term investment needs, by securities of guaranteed worth and of universal salability.

The country's finances are not well organized to supply the demand for building capital through mortgages, the type of security almost universally used for obtaining such capital. The average mortgage is not of guaranteed worth, nor is it readily salable. Properly to finance the building industry, the standard form of long-term investment, namely, bonds, should be utilized more freely. Institutions are needed to hypothecate real estate mortgages and issue bonds against them. This has been done for farm mortgages through the Federal farm loan banks; it is proposed for building mortgages

through home loan banks and a proposed Federal mortgage bank. In that direction lies the best hope of the building industry for recovering the use of its former share of the Nation's capital. Another measure that has been urged on Congress is the exemption of limited amounts of mortgage loans from the operation of the income tax, to the end that these securities shall net as great a return to the investor as municipal bonds, Government bonds, farm loan bonds, and other similarly exempted investments.

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II. THE DECREASE IN THE PURCHASING POWER OF MONEY.

THE NEW PRICE REVOLUTION.[1]

By Irving Fisher,

Professor of Political Economy, Yale University.

At the present time there is a marked halt in production. Industry is slowing down. Unemployment of labor increases. Some industrial concerns are failing to earn profits and others are suffering the dissipation of their accrued profits, because even by shutting their plants down, they can not save certain of their expenses or any of their fixed charges. The Government's revenues, dependent as they are upon the national income, may fall short at the very time we need them most. In brief, we are threatened with a widespread business depression, and from peculiar causes, for the unsound conditions usually preceding a widespread business depression are absent.

Belief that prices must drop.—The main reason why business is not going ahead better is that most people expect prices to drop. The merchant is selling, but not buying. The manufacturer holds up the purchase of his raw materials. People quote the disparity between present prices and those prevailing "before the war," and decide they will not buy much until present prices get down to "normal." This general conviction that prices are sure to drop is putting a brake upon the entire machinery of production and distribution. Readjustment waits because we keep on waiting for it. We have waited in vain for over three months. It is interesting to observe that many manufacturers think that prices must come down, including the price of labor; but they are ready to demonstrate to you that their own prices can not come down, nor can they pay lower wages. Almost everything they buy somehow costs twice as much as before the war, and their labor is twice as dear. They can not pay their labor less if labor is to meet the increased cost of living. Now, as a matter of fact, when we investigate almost any individual one of the so-called high prices for industrial products we are likely to find that individually it is not high; that is, it is not high relatively to the rest. Our quarrel is with the general level of prices.

The general price level.—Variations in the general price level may be compared to the tides of the sea, while individual prices may be compared to waves. Individual prices may vary from this general level of prices for specific reasons peculiar to individual industries, just as the height and depth of waves vary from the general level established by the tide. The causes controlling the general price level are as distinct from those controlling individual prices as the causes controlling the tides are distinct from those controlling individual waves.

Individual versus universal price influences.—All prices have risen, but some have risen more, some less, than the average, for particular reasons affecting each industry. In some cases an improved organization of both employers and employees has enabled them to combine against the public and take full advantage of the price advance. The war brought about an abnormal demand for certain products, like copper and steel, and they advanced faster than the average. The abnormal demand

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[1] Written for the U. S. Department of Labor and originally published as a separate bulletin of the Division of Public Works and Construction Development.

having disappeared, these prices are being adjusted downward. Wheat is a case where demand increased and at the same time certain of the usual sources of supply—Russia, Australia, and Argentina—disappeared, with a resultant abnormal price increase. The closed sources of supply have opened again, and wheat prices in the world market have dropped. In some cases, as in many of the industries making building materials, the war meant a great slackening in demand, an enforced curtailment in use by Government order. In such instances we are likely to see an upward swing in prices as the suppressed demand again makes itself felt. To-day we are witnessing throughout the country such price readjustments, up and down, but the general price level has shown little sign of falling, as is evidenced by price index numbers. It is apparent to every thoughtful observer that some great force has affected all prices, creating a new standard to which they are all conforming.

The fundamental practical question confronting business men is whether the general level of prices is going to fall. In my opinion, it is not going to fall much, if at all. We are on a permanently higher price level, and the sooner the business men of the country take this view and adjust themselves to it the sooner will they save themselves and the Nation from the misfortune which will come if we persist in our present false hope.

Its dependence upon the circulating medium.—The general level of prices is dependent upon the volume and rapidity of turnover of the circulating medium in relation to the business to be transacted thereby. If the number of dollars circulated by cash and by check doubles while the number of goods and services exchanged thereby remains constant, prices will about double.

The great price changes in history have come about in just this manner. The "price revolution" of the sixteenth century came upon Europe as a result of the great influx of gold and silver from the mines of the New World. Europe was flooded with new money. More counters were used than before in effecting exchanges, and prices became "high." People talked then of temporary "inflation," just as they talk of it now. But it was not temporary; it was a new price level.

A similar increase in prices all over the world occurred between 1896 and 1914, following the discovery of the rich gold fields of South Africa, Cripple Creek, and Alaska, the invention of the cyanide process in mining, and the vast extension of the use of bank credit.

Extension of credits.—Circulating credit—that is, bank deposits subject to check and bank notes—is a multiple of the banking reserve behind these deposits and notes; and the essence of this reserve is gold. Our present monetary system is an inverted pyramid, gold being the small base and bank notes and deposits being the large superstructure. The superstructure grows even faster than the base. The deposits are the important elements. They are transferred by check from one individual to another; that is, the circulation of checks is really the circulation of deposits.

Thus any increase in the country's gold supply has a multiplied effect. The possible extent of that effect is dependent upon (1) the amount of gold available, and (2) the gold reserve requirements, determining the volume of credit that can be put into circulation based upon the gold. Over a billion dollars in gold has come into this country from abroad since 1914, and a large amount has disappeared from domestic circulation. The gold from both these sources has found its way into the United States Treasury and into bank reserves. On June 30, 1918, the portion of the gold reserve of the Federal reserve banking system which supported national bank deposits and Federal reserve notes was more than three times as large as the gold reserves under the old national banking system on June 30, 1914—$1,786,000,000, compared to $592,000,000. During the same period credit instruments (demand deposits and notes) increased about twofold—from $6,100,000,000 to $11,700,000,000. This increase of credit instruments is typical of the banking situation for the country as a whole and largely explains the present high level of prices. The increase of gold has been

so great, however, that the base has grown faster than the superstructure—which is contrary to the normal tendency. The ratio of gold to credit has risen from 9.6 per cent to 15.3 per cent. The legal reserve requirements of the present system are such that for 1918 there is an excess of gold above these requirements of more than $700,000,000. The reserve required by law to support the $11,700,000,000 of credit instruments of 1918 is $1,070,000,000. The $700,000,000 of free gold could support an additional superstructure 70 per cent as large as the existing one, which indicates that for the banking of the country as a whole a potential future expansion of 50 per cent is a conservative estimate.

False views of inflation.—Many people, referring to this inflation in the circulating medium, and assuming that it is temporary, are waiting for this inflation to subside. When we speak of inflation we mean more circulating medium than is needed to transact the business of the country on a given price level. But what price level? Some people mean the price level of 1913-14. Our currency is certainly inflated in terms of the prices of that period, just as the currency in 1914 was inflated with respect to the prices of 1896, but our currency is not inflated at the present time relative to the new level of prices in the world which the war has brought. The country's volume of money will have to be judged in terms of this new price level, not in terms of a price level that is past. To speak of the present "inflation" as temporary is to assume the very thing about which we are contending—to assume that the normal prices are those of 1914.

Basis of expectation as to future movement of prices.—Let us examine the factors upon which any future price movements must depend.

1. *Gold will not return to circulation.*—No great effect in the direction of falling prices can be expected from any return of gold and other lawful money into daily circulation. Such a reversion would be contrary to monetary experience everywhere. When people have learned to leave their gold and silver in the banks and use paper money and checks instead they find the additional convenience so great that they will never fully return to the old practice.

2. *No great outflow of gold through international trade.*—It should be noted that many of the former reasons for a flow of gold from America abroad have disappeared. We used to owe Europe a huge balance of interest payments upon American securities she held. The situation is reversed to-day. Moreover, Europe must pay us money for the materials we will send her for reconstruction, or at least pay us interest on credit we will extend her. Thus our exports will probably exceed our imports during the reconstruction period. We used to pay ocean freight money to foreign carriers; to-day the American merchant marine will keep in American hands tens of millions of dollars of ocean freight money. The huge volume of American tourist travel abroad, for whose expense we had to settle, has stopped and can not resume for a year at least. For all these reasons the lines are laid for a movement of gold from Europe here rather than a movement of gold from America to Europe.

"Yes, but," people say, "wait until trade is resumed between the United States and Europe, then surely 'low-priced European goods' will flow over here in such enormous volume that they will liquidate all annual obligations to us in goods." Ultimately Europe must pay her obligations to us in goods, but it will take many years. Meanwhile she needs our tools, machinery, and raw materials for immediate reconstruction.

The fact: European prices have risen more than ours.—At the present time European goods are not "low priced" (however little the money wages of European labor will buy). Prices in Europe since the war began have risen more than they have in the United States. The price rise has been less the farther from the seat of hostilities. It was least in Australia and New Zealand. It was next least in the United States, Canada, and Japan. Then came neutral Europe; then our present allies, and finally Germany and Russia. Gold tends usually to flow from high-priced

countries to low-priced countries, so that until "inflated" European prices fall gold is not likely to flow thither. Prices are no more likely to fall there than here, and for the same reasons, which will be explained below.

3. *Reduction of outstanding credit.*—The chief dependence of those who predict lower prices is on a reduction of the superstructure of credit resting upon our gold rather than on any reduction in the volume of this gold itself. They look for a contraction of bank credit, a reduction in the volume of deposits subject to check, which circulate throughout the country.

Effect of Government loans on credits and prices.—But the main cause for the present extension of bank credit is the liberty loan, and there is soon to be another. Subscribers for the new loan will not pay for their bonds in full any more than they did in the previous cases but rather less. Many of them will deposit the bonds with the banks as security for loans to be repaid later. The effect on our circulating medium will be the same as if the Government were to impose a levy of $6,000,000,000 of credits upon the Federal reserve banks, and then order them to apportion these credits out among the banks of the country. This process will certainly lead to an expansion of credits. The former issues of liberty bonds are still carried by the banks to a considerable extent. It may be contended that the bank credit expansion represented by the new victory notes has already occurred in the form of Treasury certificates, which are merely to be funded by the victory notes. The victory note issued thus represents only a shifting of the obligation to pay credits advanced to the Government, a shifting from the shoulders of the banks to the shoulders of the victory note buyers. The volume of outstanding bank credit remains the same. To a certain degree this contention is true. But a portion of the April victory note issue will go to pay future expenditures, not accrued expenditures. Then as soon as the Government needs additional money, it will issue new Treasury certificates, resulting in new extension of bank credit. Moreover, there is little doubt that there will be at least one more Government bond issue during the reconstruction period, and this will tend to further increase our present credit structure.

Foreign government borrowings, same effect.—The banks must lend credit and create deposits to meet the expenditures not only of our own Government, but of foreign Governments as well. The same thing results even if these Governments are served directly by private investors here instead of via the United States Treasury. These investors pay for foreign Government bonds as they do for our liberty bonds—on the installment plan—paying a small part down and borrowing the rest from the bank. This increased purchasing power will be mostly spent in this country for supplies to be sent abroad for rehabilitation. This continuance of vast loan issues, connected with war and reconstruction throughout the world is a factor which will maintain the high price level temporarily, which means many months.

It is also worth keeping in mind that liberty bonds and other Government securities held here do not wholly cease being a source of credit expansion when the individual subscribers have completed their payments on the bonds and really own them. These new bonds are unrivaled security for further borrowings from banks for commercial purposes, and they will continue to be so until the Government which issues them redeems them.

The availability of the vast issues of war bonds as bases for future credit expansion, coupled with the fact that our banking system has still many unused reefs, sure to be taken out later, when business wishes to spread more sail, is the chief reason why prices will keep up permanently; that is, for many years.

Between the period of temporary and the period of permanent effects, there may be a slight dip in the price level, say a year from now. If so, it is the more incumbent upon business to proceed now; for it can not wait a year.

Commercial loans must increase.—During the war the flotation of stocks and bonds of commercial concerns has been very greatly diminished. During the period upon which we are now entering, the issue of such securities will increase greatly.

Opposition of business men to credit contraction.—Against any considerable reduction in bank credit and hence in the general level of prices, we shall find the whole business community in arms. Falling prices mean hard times for the individual and for the Nation and everyone resists the tendency. At the end of the Civil War the Treasury started to reduce the quantity of greenbacks. A start had hardly been made, however, before the business depression of 1866 and 1867 caused Congress to forbid by law any further reduction. Should the Federal reserve banks attempt, by raising their discount rate or otherwise, to reduce the volume of bank credit outstanding, they will meet with the same sort of opposition. Moreover, the hostile attitude of labor toward the lowering of wages will deter legislators and bankers from any organized policy of contraction.

Increase in deposit banking on the continent.—Looking into the still more remote future, there will be in Europe, particularly on the Continent, a vast increase in deposit banking. The need of the Governments there for funds during war times hastened the introduction of deposit banking. Money went out of circulation into bank vaults, and there became the basis for circulating credits. This means a new habit which will lead to a great currency expansion. Far-away countries, like India and China, are also learning to use deposit banking. It is as if a new source of gold supply had been discovered. What has been discovered is a new way of using the gold supply. The world, during the course of the war, has thus started, or has hastened, an equivalent of the price revolution of the sixteenth century.

Go ahead on the new price level.—Business men should face the facts. To talk reverently of 1913–14 prices is to speak a dead language to-day. The buyers of the country, since the armistice, have made an unexampled attack upon prices through their waiting attitude, and yet price recessions have been insignificant. The reason is that we are on a new high-price level, which will be found a stubborn reality. Business men are going to find out that the clever man is not the man who waits, but the one who finds out the new price facts and acts accordingly.

THE NEW COMMODITY PRICE LEVEL.

Why prices were expected to fall with the end of the war.

During the war most people believed that with the coming of peace there would come a great fall in prices. They saw prices rising to abnormal heights because of the war and expected that in the post-war period prices would find their prewar level, the cause of high prices—war—no longer existing. A more particular statement of this point of view was that war orders for commodities and the scarcity of these commodities relatively to the demand brought the high prices. Naturally with the end of the war, the abnormal demand for commodities would disappear and prices would consequently descend to their old level. But in many quarters it was feared that the transition from war to peace would involve not only a return to prices as low as before the war, but an industrial crisis resulting in an utter collapse of values. Although no attempt will be made to give a complete catalogue of the reasons advanced for expecting such a disaster to industry, some of the more common arguments will here be noted. It was pointed out that industrial

plants in the United States, stimulated by war orders, developed an abnormal capacity of production. With the coming of peace the managers of these plants, in order to retain the economies of full capacity production would slash prices to obtain business. It was furthermore pointed out that industry in European countries had also been stimulated and had achieved an abnormal capacity for production. It might be expected therefore that price cutting would take place in those countries among their own manufacturers just as in this country, and a surplus of goods being produced in all the leading industrial countries, competition in prices would become international when the manufacturers of each country tried to dispose of their surplus abroad. To add to the danger of cutthroat competition both on a national and on an international scale was the fact that the demobilization of vast armies might be expected to create armies of unemployed in all industrial countries on a scale never before equaled. These unemployed workmen it might be expected would be willing to work for any wage the manufacturers, driven to desperation by cutthroat competition, would see fit to offer. Finally, to make the pessimistic view complete, the attitude of buyers in falling markets was emphasized. All buyers whether consumers, retailers, jobbers, wholesalers, or producers have a tendency to pursue a hand-to-mouth policy in buying during periods of falling prices, putting off each purchase as long as possible in the expectation of being able to buy more cheaply later on. Thus the abnormally large output of the manufacturers would be thrown on a market which would be abnormally small because of the watchful waiting policy of buyers.

The present situation.

Such having been the psychological attitude of most people in the United States, it is remarkable that with the armistice seven months old we find business no worse off than it is. The dire turn of events prophesied has not come to pass. It is true that war orders have largely come to an end, and this has reduced the market for the products of many industries. It is true also that the policy of watchful waiting for a fall in prices has been steadily pursued by millions of buyers and that as a consequence business is halting. The National Association of Manufacturers issued a report (April 14, 1919), based upon a canvass of 4,000 representative establishments in practically every line of industry in the United States. Of 22 groups of industries comprised in the study, 5 reported business good, 1 reported business fair to good, and 16 reported business conditions below 50 per cent of normal. But in spite of all this, commodity prices have fallen but little during the seven months since the armistice was signed. Wholesale food prices as reported by the Annalist have risen considerably since February 1, 1919, and the average price of 25 leading indus-

trial stocks as reported in the Annalist had reached in the first half of May a higher level than at any time since July, 1917. The price slashing and cutthroat competition, national and international, has not materialized. Let us examine in a broad way the causes of the present condition and the prospects for the future.

The rôle of inflation.

The rise in prices during the war was not brought about simply by war orders for commodities and a scarcity of goods relatively to the abnormal demand. The various Governments of the world found it expedient in order to obtain the commodities required for waging war on a large scale to inflate the currency either directly by the issue of paper money or indirectly by the issue of bonds which were used as a basis of credit. Now, although the war orders have largely come to an end, and the scarcity of commodities relatively to demand has somewhat diminished, the inflation of the currency is still with us, and not a thing of the past. This matter is fully discussed in the section of this report called "The New Price Revolution," written by Prof. Irving Fisher. Prof. Fisher, after a careful survey of the whole problem of present and probable future expansion of money and credit, concluded that we are on a permanently higher price level and can not because of this expansion expect any substantial decline in prices.

The watchful waiting policy of the buyer.

The watchful waiting by buyers for lower prices which is characteristic in times of falling prices has not had the usual disastrous effect because the period of rising prices during the war differed in a vital respect from the usual period of rising prices. Ordinarily during a period of rising prices extending over a number of years production of commodities keeps nearly abreast of demand and finally outstrips consumption, an accumulated surplus being the result. Buyers, generally, noting the constantly rising prices, lay in abnormal supplies. Consumers buy in advance of their real needs, arguing, for example, that although they do not need a new pair of shoes or a new suit just at present, it is a wise plan to buy because later the shoes will cost a dollar more or the suit $5 more. Likewise the retailer, the jobber, and the wholesaler note the advantage to be gained over their competitors by buying early, before the next advance in prices. Manufacturers, also, buy raw materials freely and manufacture stocks in advance of sales in the expectation of profiting by lower costs than are likely to prevail later on. Hence it happens that when the ordinary wave of high prices has reached its crest consumers are well supplied with goods of all kinds, retailers' shelves are laden, and warehouses of jobbers, wholesalers, and manufacturers are filled to the roof. Then when the turn comes and prices

begin to fall, buyers are not only inclined to defer purchases, but are so well stocked up that if it seems wise they may practically stop buying altogether.

But during the war, although prices were rising and it may have seemed wise to buyers to lay in supplies for future use, they did not do so. Consumers responding to the call of patriotism refrained not only from buying in advance of need but even from buying their customary supplies. Some refrained from buying because they had spent their money for bonds or war saving stamps; others because they voluntarily refused to compete with the Government for supplies. Retailers, jobbers, and wholesalers either could not get large supplies or refrained from buying, for patriotic reasons. In the case of manufacturers those who manufactured nonessentials had their business regulated by Government orders and could not manufacture on a normal scale, let alone pile up a surplus. Those who manufactured for the Government had all they could do to turn out the goods demanded for immediate consumption. Hence there was not when the war ended a surplus of goods in the hands of any class—consumers, retailers, jobbers, wholesalers, or manufacturers. The watchful waiting for lower prices manifested itself, but it had the minimum capacity for mischief. When a man's best suit begins to go to pieces, pride and decency compel him to buy another, whatever he may think of the general level of prices in the future. When the retailer begins to lose sales because he has no goods on hand, he buys regardless of the possibility of a cheaper purchase later on; and so do the jobber and wholesaler. The manufacturer also will keep his factory going regardless of the prediction of lower costs in the future if by closing down he loses present business.

Production during the war.

That the available stocks of commodities of all kinds are depleted is pretty generally acknowledged. This fact is emphasized in the report of the National Association of Manufacturers already referred to. In fact it could hardly be expected that any considerable stocks should exist at the end of the world war, with its giant capacity for consumption. That stocks of commodities in general are largely exhausted is hardly capable of statistical demonstration. But in so far as statistics of production are available for leading commodities, they tend to show that it is useless to look for hoarded stores of commodities, either raw materials or finished articles. In the accompanying table (Table I), "Production of leading minerals in the United States and the world," some light is thrown both on the probability of stocks of goods on hand and on the question of expansion of industry during the war.

TABLE 1.—*Production of leading minerals in the United States and the world, 1913–1918.*

	Unit.	1913	1914	1915	1916	1917	1918
Coal:							
United States	Short tons	569,960,219	513,525,477	531,619,487	597,474,000	551,790,563	685,000,000
World	do	1,475,226,101	1,323,972,215	1,313,902,648	1,365,000,000	1,259,000,000	1,300,000,000
Petroleum:							
United States	Barrels	248,446,230	265,762,535	281,104,104	300,767,158	335,315,601	.....
World	do	383,753,547	398,698,366	427,740,129	460,901,973	500,229,929	.....
Iron ore:							
United States	Long tons	61,980,437	41,439,761	55,526,490	75,167,672	75,288,851	.....
World	do	174,092,499	.....	.....	.....	.....	.....
Copper:							
United States	Pounds	1,224,484,098	1,150,137,192	1,388,009,527	1,927,850,548	1,886,000,000	1,869,948,334
World	do	2,198,733,223	2,068,973,915	2,346,300,299	3,106,995,660	3,141,960,000	3,020,654,736
Lead:							
United States	Metric tons	373,615	465,155	459,923	500,926	498,810	.....
World	do	1,153,000	(a)	(a)	(a)	(a)	(a)
Spelter:							
United States	do	314,470	320,251	444,043	605,043	605,449	607,370
World	do	992,000	(b)	(b)	(b)	(b)	(b)

a Statistics not available for all countries, but probably on the whole a decrease rather than increase outside of United States since 1913.
b Most spelter outside United States is produced in Austria, Belgium, France, and Germany, for which no statistics are available later than 1913.
Source: Coal production statistics in 1918 were supplied by the Fuel Administration. Iron ore production statistics for the United States in 1917 are from the Iron Age. All other statistics in this table were supplied by the Geological Survey.

TABLE 2.—*World production of agricultural commodities.*

Cereals.	Unit.	Average, 1911–1913.	1914	1915	1916	Careful estimate, 1917.	Careful estimate, 1918.
Wheat	Bushels	3,776,908,000	3,494,586,000	4,151,556,000	3,091,569,000	2,649,948,000	3,463,145,000
Rye	do	1,781,534,000	1,569,882,000	1,577,490,000	1,492,766,000	1,300,000,000	1,000,000,000
Corn	do	3,918,650,000	3,858,416,000	4,214,205,000	3,445,395,000	3,750,000,000	3,250,000,000
Oats	do	4,423,607,000	4,049,372,000	4,375,450,000	3,967,164,000	3,750,000,000	3,750,000,000
Rice	1,000 pounds	91,236,000	103,102,000	107,421,000	103,667,000	108,000,000	100,000,000
		1913–14	1914–15	1915–16	1916–17	1917–18	
Sugar:							
Beet sugar	Tons	9,434,000	8,763,000	6,849,000	5,951,000	4,678,000	.....
Cane sugar	do	11,169,000	11,356,000	11,957,000	12,623,000	13,992,000	.....
Total sugar	do	20,603,000	20,119,000	18,806,000	18,574,000	18,670,000	.....
Cotton	Bales	25,893,000	28,540,000	21,541,000	21,963,000	21,022,000	21,305,000

NOTE.—Most of the above statistics were supplied by the War Trade Board.

World production of coal in 1913 was greater than in any year since that time. Not only was there not an abnormal expansion of the coal industry from 1913 to 1918 but not even a normal increase. Here, then, in the development of this fundamental industry during the war there is no indication of an expansion of industry as a whole. In the United States coal production in 1918 exceeded that of 1913 by about 20 per cent, but this was a smaller relative increase than from 1908 to 1913. In 1914, 1915, and 1917 the production of coal in the United States was less than in 1913.

Petroleum production showed a large increase from 1913 to 1917, both in the United States and in the world as a whole. Figures for 1918 are not given in the table, but there was doubtless a further increase in 1918. The increase from 383,753,547 barrels in 1913 to 500,229,929 barrels in 1917, was relatively but little larger than the increase in the four years from 1909 to 1913. For the United States alone also the increase during the four years 1913 to 1917 was relatively about the same as from 1909 to 1913. Production of petroleum therefore does not indicate an abnormal expansion of industry as a whole.

Iron ore production statistics for the world are not available. But in the United States, which produced more than one-third of the world's iron ore in 1913, production increased only from 61,780,437 tons in 1913 to 75,288,851 tons in 1917, an increase of less than 25 per cent. This also could hardly be called an abnormal expansion.

Production of copper both in the world as a whole and in the United States increased more rapidly. From a production of 2,198,733,223 pounds in 1913 the world's output increased to 3,020,654,736 pounds in 1918, an increase of 37 per cent. During the same period production of copper in the United States increased about 50 per cent. During the five years from 1908 to 1913 production of copper both in the world as a whole and in the United States alone increased approximately 30 per cent. When the abnormal consumption of copper in the manufacture of munitions is considered in the light of this increase in production, it becomes evident that no considerable surplus of articles containing copper could have existed when the armistice was signed. Since then the copper companies have accumulated a considerable surplus of copper. Whatever surplus the copper companies have accumulated since the cessation of war orders will probably fall far short of covering the present shortage of copper in the countries which during the war have been cut off from normal supplies.

Lead production statistics for the world are not available. Production in the United States increased about 33 per cent during the four years from 1913 to 1917. Production of spelter almost doubled in the United States from 1913 to 1918. This no doubt represents an increase considerably above the increase that would have occurred

if there had been no war, and it is doubtful whether the markets will absorb the capacity production of our lead and zinc industries in the near future.

The foregoing statistics taken as a whole indicate two things: (1) That no surplus of those minerals was accumulated during the war; (2) that there has been no such large increase in the productive capacity of industry as a whole as is apparently widely assumed. It is only certain industries concerned primarily with war production that have expanded far above normal. The end of the war did not so much necessitate cutting down of production as a whole as a readjustment of production from a war to a peace basis. This readjustment is no doubt a costly process, but the cost has been largely liquidated by the large corporations in the way of abnormal deductions from profits under the head of amortization or depreciation.

In agriculture there has been not only no abnormal increase in production, but on the contrary an absolute decrease. As shown in the accompanying table on "World production of agricultural commodities" (Table 2) the production of wheat, corn, rye, oats, sugar, and cotton during the war fell below the prewar average. In the case of rice only was there an increase. No surplus of foodstuffs nor of cotton is available in the world, and productive capacity of the year 1919 is hardly great enough to meet the needs of the world. A collapse of prices resulting from an unmarketable surplus of agricultural products is an event that need not be feared.

What the business man still fears.

Although no sharp fall in prices has occurred, or perhaps because no sharp fall has occurred, the business man still fears to go full speed ahead. To point out to him that inflation still exists and will tend to maintain high prices, that stocks of commodities are exhausted and must be replaced, and that the present productive capacity of the world industry is probably not large enough to glut the market, does not remove his uneasiness. Two thoughts in the minds of business men are exercising a repressive influence upon industry. The first is that prices inevitably are going to move downward toward the prewar level, and that this movement will be substantial enough to give the producer or dealer who defers operations for some time an important advantage over his competitor who goes ahead at present. This is the immediate cause of the halting condition of business at present. Lurking in the background is the second thought of the business man, namely, that the productive capacity of world industry is going to expand more rapidly than the world market for its products, and that there is danger of a universal collapse in the industry of the world.

Costs of production.

Now, what are the facts as to the prospect of a substantial recession of prices from month to month; a recession sufficient to cause a greater loss to the business man who goes full speed ahead than to the one who waits? Prices of commodities, including agricultural products, cover the costs of doing business and profits, and may be analyzed into the following constituents: (1) Interest on borrowed money, (2) materials used, (3) taxes, (4) a fair return on the capital and labor of the owner, (5) excess profits, (6) wages.

Prices can not fall unless costs decrease or business men, including farmers, are willing or compelled to forego their profits. What are the prospects of a decline of costs or profits?

The interest rate advanced during the war and has played a part, therefore, in higher cost of production, though only a minor part. There is little prospect for a substantial reduction in the rate of interest, and still less prospect of any appreciable reduction in the total cost of production from this source.

The finished product of one industry may become the raw material of another. Hence analysis at this point is difficult. It may be maintained, however, that the cost of raw materials of any particular industry, including agriculture, will not decline until the costs of production or profits of other industries have declined. Hence, generally speaking, any decline in the costs of raw materials must be the result of a decline in interest, wages, profits, or taxes.

Taxes may be subdivided for our purpose into excess profits and income taxes and other taxes. Obviously, if the excess profits or income of any industry decline, the excess-profits taxes and income taxes on such industry will also decline. Aside from that, no substantial decrease in taxation is to be expected in the near future. Even if Federal taxes grow less it is altogether likely that State and local taxation will grow heavier.

It is not to be expected that business men, including farmers, will in the future lightly forego a fair return on their capital or their own labor. The only thing which would tend to compel them to do so is production far in excess of demand, which would compel producers to sacrifice their products for what they could get. This point will be discussed further under the head of future demand for goods.

Excess profits, particularly where excess profits are due mainly to increased prices rather than to increased volume of production, will no doubt diminish and some decrease of prices may be expected from this source. Some industries during the war sold their products at exceedingly high prices and realized abnormally large profits for that reason. It is probable that world shortage of many commodities will still enable some of these industries to realize abnormal profits in the after-war period. But they can not all hope to continue selling their

products at top war prices. Competition or Government interference would bring down their profits, even if no voluntary reduction were made. It should be added here that a large part of what in some quarters is considered excess profits of the farmer is only a fair return on his capital and labor, very inadequately compensated before the war.

Wages are unlikely to be generally reduced during the forthcoming months. Some reductions have occurred since the armistice, the most important of which have been reductions of overtime and bonuses, and little further decrease can be expected from this source. On the other hand, there have also been some increases in wages, notably in the building trades and in the case of railway employees. On the whole the attitude of employers in the United States seems to be not to reduce wages until the cost of living is reduced. When this attitude of employers is taken into consideration along with the tremendous opposition of wage earners to a reduction, little reason can be seen for expecting lower costs of production through lower wages.

The foregoing analysis although brief and imperfect, seems to show pretty clearly that no substantial decrease in costs of production is in sight in the immediate future. Of course, if abundant stocks of goods were on hand and buyers enjoyed the strategic advantage over sellers of being able to hold off longer, then prices would break somewhere regardless of costs of production. But as has already been pointed out, buyers at the present time do not have this strategic advantage over sellers. In this analysis of costs no account has been taken of the effect of increased efficiency, and increased efficiency can not be left out of account altogether. Even if the rate of interest, wages, cost of raw materials, and taxes were not reduced, cost of production per unit would be reduced by an increased efficiency in production which multiplied the number of units turned out in a given plant in a given time. But it is not the reduction in prices resulting from reduction in costs due to greater efficiency in the future that the business man fears in the months just ahead. It is the reduction resulting from lower wages and lower raw materials that he fears. The possible reduction in costs due to increased efficiency lies a little farther in the future.

Increased efficiency.

It was pointed out above that there is a certain fear that a greatly increased capacity in production owing to lessons in efficiency learned during the war, will flood the world with commodities beyond the capacity of the world market to absorb, and will bring about a universal collapse of values. Although this expected glutting of the world market lies some distance in the future, the fact that it is

expected is already exercising a repressive influence on industry. Undoubtedly there are strong reasons for expecting a greatly increased volume of production, and some of these reasons will be enumerated.

1. Efficiency in industry through better organization and new inventions was stimulated during the war as never before.

2. The war necessarily brought into use tests for military fitness which were applied with good results. These included tests for physical fitness for the performance of a particular kind of work, tests of general mental ability by which a man could be placed in the proper station, and tests for technical training. It is altogether likely that wider use will be made of such tests in industry in the future than ever before.

3. Industrial training is being resorted to on a larger scale than before the war both in school and factory, and will increase industrial efficiency.

4. The wider development of workmen's compensation laws and a more general campaign for better health for the workers will have a marked effect on efficiency.

Now what will be the effects of such an increased efficiency in industry? Will it mean an extreme reduction in the cost of production on the one hand, and a glutting of the world markets on the other, so that even with his low costs of production the manufacturer will be compelled to sell at a loss? To enter into the realm of prophecy to answer this question is dangerous. But a few facts bearing on the situation will be presented which should serve to free business men to some extent from the fear that this increased efficiency in production, which should be a blessing for the world, will prove an obstacle to their own prosperity.

Efficiency and wages.

Whatever increase in efficiency of production is achieved either in the immediate or the more remote future will appear to wage earners as an increase in the efficiency of labor. Factory managers may improve their system. Tests of fitness not devised by himself may make a certain laborer more efficient by putting him to the task best fitted to his ability. Marvellous new machines to increase production may be installed. But whatever the cause of the increased output may be, the result will be a greater output per man. Labor will strongly contend that it should benefit from this increased output per man. This is not prophecy but merely a statement of what will happen in the natural course of events. Now it appears from facts at present available in abundance that labor is altogether likely to receive a large share if not most of the benefit of this increased production.

Long before the world war labor leaders objected strongly to having labor considered simply a passive commodity to be bought on the open market by employers at prices yielding them whatever profit the uncontrolled law of supply and demand might permit. These leaders were striving and to a certain degree succeeding in obtaining for the wage earners a voice in industrial management. The war has been won for the allied countries, and labor in western Europe and in the United States is now striving more vigorously than ever to obtain for itself some share in the management of industry, while in Russia and apparently in central Europe it is striving to obtain not merely a share in control but absolute control of industry. The wage earning class supplied most of the man power and sacrificed much in the war and therefore feels justified in asking for a comfortable living after the war. Labor's position is strengthened by the favorable attitude of the Government, at least in the United States and in Great Britain. It is further strengthened by the present shortage in man power, which is not likely to be offset by increased employment of women.

There is much evidence that employers in the United States are desirous of approaching labor in a spirit of conciliation and cooperation. Many believe that labor should be better paid than ever before. Charles M. Schwab, for example, one of the largest employers of labor, recently expressed himself publicly as doubting that labor has in the past received its due. The attitude of John D. Rockefeller, jr., is well known. He believes that wage earners have a right to a high standard of living and has for years been laboring to bring about a spirit of cooperation with labor in the plants in which he is interested by organizing the employees in these plants and developing joint committees representing capital and labor. His plan has been severely criticized as being too narrow and placing control too largely in the hands of the employer. As stated in an address before the War Emergency Congress of the United States Chamber of Commerce at Atlantic City (December, 1918), his plan does not seem so open to criticism as has been affirmed. To quote from this address:

> The most potent measure to bring about industrial harmony and prosperity is adequate representation of labor in industry. The most effective structure of representation is that which is built from the bottom up; which includes all employees; which starts with the election of joint committees in each industrial plant; proceeds to the formation of joint district councils and annual joint conferences in a single industrial corporation; and admits of extension to all corporations in the same industry as well as to all industries in a community, in a nation, and in the various nations.

This form of organization would probably be opposed by advocates of trade-unionism as destroying trade-union organization in favor of industrial unionism. But it is not the purpose of this report to point

out what form of organization is to be desired, but merely to show that it is becoming apparent that employers feel the need of cooperating with organized labor and are willing to meet labor halfway in some provision for representation of labor in industry. There are, still, of course, exceptions, and some employers would infinitely prefer to come to terms with labor by holding over labor's head the club of unemployment rather than by inviting its representatives to participate in the management of industry. But with labor unions strongly intrenched, having both economic and political weapons at hand; with liberal governments favoring the organization of labor and its representation in industry; with public opinion, as expressed by such a conservative spokesman as William H. Taft, favoring unionization and collective bargaining as against the outworn system of individual bargainings; and with the fear that bolshevism is lurking in the background ready to advance if the laboring class as a whole is not given an opportunity for not merely a living but a comfortable living and a chance for savings, the autocratic employer of labor can not long survive. And with labor having a stronger voice in industrial management it is naturally to be expected that with increased efficiency in production labor will receive increased wages. That is to say, labor cost, the greatest single factor in cost of production, will not decline in proportion to the increase in output per man per day, but instead wages per day or week will tend to rise. Consequently there will not be the same tendency to slash prices in competition for business as there would be if increased efficiency in production were accompanied by an extreme decline in the costs of production.

To conclude this section, it may be said that wage earners as a whole in the United States have not in the past received wages sufficient to provide them with a comfortable living with a little left over for recreation and old age. This has been sufficiently discussed by many writers. Some have accused big business of paying labor less than it was able and accumulating enormous profits for the few. Defenders of the few have replied that these accumulated fortunes even if distributed among the many would not materially improve the conditions of the masses and that the main trouble has been insufficient production, rather than unjust distribution. Now there is the hope of much more efficient production. All—labor, capital, and the public—seem to agree that if it is possible labor should receive more. It is therefore to be expected that labor will receive higher wages than ever before if the expected increase in efficiency is realized, provided of course the employer can find a market for his product. Even if higher wages are paid as production increases per man and the costs of production are thus largely stabilized, will prices of the product not have to be cut in order to find a market?

Without attempting here the task of prophesying the exact course of prices as affected by increased volume of production, we desire to point out a few pertinent facts relating to the probable demand for commodities in the forthcoming months and years.

Abnormal demand for construction materials.

There are many reasons for expecting a demand for commodities in the after-war period greater than normal. Only some of the most important reasons will be touched upon here.

There will be a tremendous demand for commodities for rebuilding the regions devastated by the war. Buildings, bridges, roads, and other improvements have been destroyed and must be replaced in France, Belgium, Serbia, Roumania, Poland, and in other countries. It is neither possible nor necessary here to attempt a statistical computation of the tons of material or the thousands of men required for this reconstruction work. It is evident that here alone is a work of great magnitude calling for abnormal activity of postwar industry.

In the nondevastated regions of the belligerent countries production of durable goods not necessary for military purpose was largely neglected during the war and in many instances prohibited. The nations of the world are suffering a shortage of houses running into billions of dollars. According to Jacques Greber, chairman of the French commission on reconstruction, visiting the United States in June, 1919, sixteen billions of dollars will be required to replace the structures destroyed in France, making no allowance for the construction deferred by the war. Roads and railways have deteriorated during the war and must be improved. In the United States particularly a campaign for good roads under way before the war will now be pressed with renewed vigor. For this purpose not only great quantities of sand and gravel and other raw materials but much road-constructing machinery will be needed, and the railways will be called upon to transport road-making material in unprecedented quantities. Industrial equipment in some industries has not been kept in a state of repair and will need to be repaired or renewed and increased. The shipbuilding activity repairing the losses inflicted by the submarine as well as to permanently strengthen our Navy will require the labor of many thousands of men more than were formerly engaged in this industry in peace times and great quantities of iron and steel and other commodities. In many countries the development of water power was seriously being contemplated before the war and will now in the post-war period receive renewed attention. In the United States Congress will hardly delay longer in making possible the utilization of our enormous water power now largely going to waste. Switzerland, which suffered greatly during the war for lack of fuel, will lose no time in getting under way the development of its magnificent water power, and in other countries, as, for example, in Italy, great activity

in electrification may be expected not in the remote but in the immediate future. Development of waterways also may be expected to be pushed with vigor. These points need only to be mentioned to bring the realization of a tremendous potential demand for commodities which will become active once the burden of doubt and uncertainty is removed from the shoulders of the industry of the world. It should not be forgotten also that the industries called upon to supply materials for the building of houses, roads, railways, bridges, factories, ships, power plants, etc., will themselves need materials in turn. Steel mills, lumber mills, smelters, cement mills, etc., will require coal and machinery on an enormous scale.

Abnormal demand for consumers' goods.

But not only will there be an unprecedented demand for materials for the construction of tools of industry with which to increase production such as houses, railways, factories, water powers, and ships, but an exceptional demand for consumers' goods unless checked by inculcated habits of thrift. The war waged upon such a tremendous scale has given new experiences to a large share of the world's inhabitants, has taught them new wants which they will strive to satisfy in the future. This is a matter of such importance that it deserves somewhat detailed consideration. It is a subject concerning which doubtless many books will be written in the next generation. Let us consider first the case of the men mobilized during the war. The Current History Magazine for February, 1919, gives the following figures as representing the mobilized strength of the belligerents during the war:

United States	4,272,521
British Empire	7,500,000
France	7,500,000
Italy	5,500,000
Belgium	267,000
Russia	12,000,000
Japan	800,000
Roumania	750,000
Serbia	707,343
Montenegro	50,000
Greece	230,000
Portugal	100,000
Total allies	39,676,864
Germany	11,000,000
Austria-Hungary	6,500,000
Bulgaria	400,000
Turkey	1,600,000
Total central powers	19,500,000
Grand total	59,176,864

Consider this: A number of men greater than the total population of either France, Great Britain, or Italy or three-fifths that of the United States lifted out of the customary round of things and placed in a new environment, learning to wear different apparel, learning to eat different food, learning the thrill of doing new things and seeing new places. For some, of course, the range of new experiences was wider than for others. It may be said, perhaps with more grim humor than truth, that the soldiers of the central powers and the Russians probably learned little but privation with respect to food and clothes.

Even if we should concede that some soldiers through lack of supplies learned to like no new foods nor to like new kinds of clothing from first-hand experience, all must have seen unaccustomed articles of food, apparel, and other articles to which they took a fancy and which they will want in the future.

It is particularly those soldiers of the allied armies who saw overseas service and were at the same time supplied with the means of living as well as war conditions permit who will be found in the future to have developed new desires which, if gratified, will involve on their part heavier consumption of goods. On November 11, 1918, the number of American soldiers in Europe or on the way was 2,053,347. Furthermore the number in the Navy was 529,544. Canada sent overseas 800,000 men, Australia sent abroad 336,000, and India sent to France, Mesopotamia, Egypt, Gallipoli, Saloniki, Aden, and to the Persian Gulf 953,374 native troops and 219,534 British troops. Then practically all the millions of British troops saw service in France or elsewhere under surroundings wholly new to most of them.

Not only will these soldiers returning from the war be filled with new desires and demand a broader variety of commodities than they would ever have thought of if they had had no war experience, but they will infect their associates at home with this contagion of new wants.

It is a matter of historical record how the mass movements of men at the time of the crusades and the migrations and voyages after the discovery of America stimulated the commerce and industry of the world. The world war has involved mass movements of men on a vaster scale than the crusades and sent more men overseas in four years than the discovery of America sent in a hundred years and will have therefore a far greater effect on world industry.

In addition to the 60,000,000 soldiers mobilized for the war there must be considered the millions of war workers in the belligerent countries turning in many cases to new occupations, meeting new people, seeing new places, learning the use of a great variety of new articles and services, and in many cases, earning higher wages than ever before, thus being able to enjoy immediate gratification of their newly discovered wants. Literally hundreds of thousands of young Americans lived in a large city for the first time in their lives during the war, and large cities with the manifold variety of food and clothing, services and amusements they offer are veritable schools for the diversification of desire. Thousands of Americans during the war coming from the country or small villages to take up war work in the cities enjoyed the conveniences of modern improvements in housing for the first time in their lives. There is absolutely no doubt that tens of millions, one might say hundreds of millions, of people in the world in the postwar period will want—in fact are now wanting—

very badly numberless things which they did not want before. Here is a potential market for consumers' goods, offering to manufacturers and dealers such an opportunity for business as never before existed, provided only this potential demand can be made an effective demand—in plain words, provided the persons who want these new articles can get the money to pay for them. Since most consumers belong to the wage-earning or salaried classes this is merely a question of high wages or salaries and steady employment, accompanied by increased capacity for production.

Conclusion.

The foregoing facts and reasons, it would seem, warrant American business men in working and planning for an immediate period of business prosperity. No collapse of values and prostration of business has occurred in the half year following the armistice, and there is no reason to expect such a contingency in the near future. The most trying period in the transition from war to peace is past.

There is a world shortage of commodities and the man first ready to meet the demand will obtain the most business. Any decline in costs for production that may take place in the forthcoming months will not serve to compensate the man who delays business operations to take advantage of it for the loss of business he will suffer through his hesitating policy. Much less will it give him an advantage over his more wide awake competitor. Not only is there a world shortage of commodities which must inevitably give rise to a great demand for commodities in the next few months but the demand for commodities in the postwar period will undoubtedly grow to unheard of dimensions owing to the greater diversification of wants brought about as a result of the world war. The enormous expansion in human wants, the strong desire on the part of hundreds of millions for the enjoyment of numberless articles and services they did not enjoy before will result in a demand that will test the capacity of world industry to meet, even if the most optimistic hopes for increased efficiency of both labor and plant are realized. If industry is properly organized, and if serious maladjustments can be avoided, manufacturers can safely banish all fear of overproduction and of falling prices. The consequences of falling prices are less to be feared than the consequences of continued increasing prices, which, in the face of the demand, may be halted only through the greatest efficiency of plant, labor, and management.

III. COST AND SUPPLY OF BUILDING MATERIALS.

SUMMARY OF FINDINGS.

This study is an attempt to present a brief history of the building materials industries through the war period and, where possible, through the first five months since the signing of the armistice. Completed in a few months, it can not pretend to be exhaustive; a thorough investigation of one industry alone—such as the lumber industry or of the clay products industry—might well occupy a year's time. Containing as it does, however, a rather comprehensive survey of records of prices and production, and of cost data, it provides a not inadequate basis for an understanding of the price situation as it affects the construction industry as a whole.

A determination of the fairness of individual prices was not within its scope. Since the only standard of fairness of the price of a commodity is the cost of its production, the only absolutely safe basis upon which to predicate such fairness is by an examination of the books of producers. Without authority it is impossible to examine these books, and this division has not had such authority.

Production costs based upon an examination of books of producers were available through other investigations, particularly through that of the investigating committee of the Illinois Legislature. In addition, in response to questionnaires and personal requests a large amount of material on wages, fuel, and transportation and other items that go to make up costs was received, with the result that a fairly reliable analysis of the industry as a whole could be presented.

On the basis of this study, and after a consideration of the general economic situation (which is dwelt on elsewhere in this report), this division has reached the following conclusions:

1. That production in most of the building materials industries was curtailed during the war.

2. That the increased prices of their products generally must be attributed to curtailed production and to increased cost of labor, fuel, transportation, and plant maintenance.

3. That any marked reduction in prices of building materials as a whole must depend upon reduction of these costs, which seems little likely to be realized in the near future.

4. That building materials are relatively low in price as compared with commodities in general.

The division believes therefore that construction in 1919 can be justified on financial grounds, and it looks to public officials and to private and speculative builders everywhere to resume building.

ACKNOWLEDGMENTS.

The principal sources of material have been other departments of the Government, especially the price section of the War Industries Board, the United States Geological Survey, and the Bureau of Labor Statistics. The task has, however, been rather more than an assembling of materials of other bureaus. The tables have, in nearly all cases, been rearranged in such a manner as to present effectively special facts, tendencies, and comparisons.

In many cases it was not possible to carry the quotations of prices furnished by the War Industries Board forward into the year 1919. Prices for 1919 have been available from other sources, but it has been difficult to match the quotations, as the different sets of prices are often quoted on different grades of materials, for different units of measure, and for different markets.

Acknowledgment should be made of the valuable cooperation of the price section of the War Industries Board, the United States Geological Survey, the Bureau of Labor Statistics, the United States Housing Corporation, the United States Forest Service, the Bureau of Public Roads, the Interstate Commerce Commission, and the Library of Congress.

Appreciation should also be expressed for the courtesy shown by all those chairmen and secretaries of war-service committees and those individual producers of materials who have furnished valuable information and expressions of opinion to this division.

Acknowledgment should also be made to those publishers who furnished copies of their periodicals from which much information of value has been obtained, and also to those architects and contractors who furnished figures on construction costs.

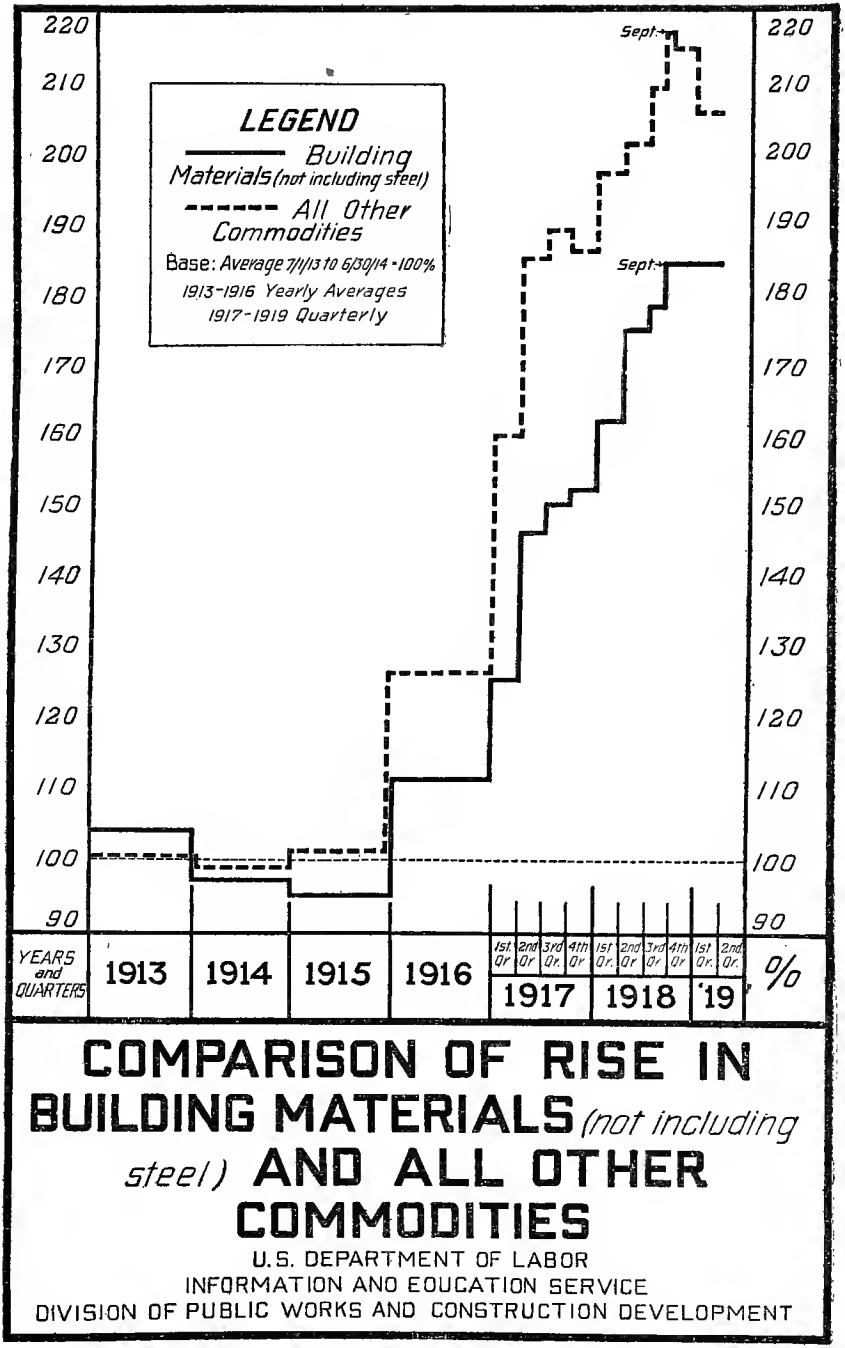
Information of a special nature was furnished to this division by the National Lumber Manufacturers' Association and its numerous allied organizations, and also by the National Association of Sand and Gravel Producers and by the Portland Cement Association.

SECTION I. COMPARISON OF BUILDING MATERIALS PRICES WITH PRICES OF OTHER COMMODITIES.

Explanation of index figures.

Table 3 gives, for purposes of comparison, index numbers based on wholesale prices through the war period on the following groups of commodities:

1. Lumber.
2. Basic building materials (lime, cement, brick, paint materials, etc.).



COMPARISON OF RISE IN BUILDING MATERIALS *(not including steel)* AND ALL OTHER COMMODITIES

U.S. DEPARTMENT OF LABOR
INFORMATION AND EDUCATION SERVICE
DIVISION OF PUBLIC WORKS AND CONSTRUCTION DEVELOPMENT

CHART I.

3. Lumber and building materials (in which the indices of 1 and 2 have been combined by a system of weighted averages).
4. Iron and steel products used in construction (consisting of structural steel, bars, nails, rivets and cast-iron pipe).
5. All building materials (the figure being combined from the series 3 and 4 by a system of weighted averages).
6. All commodities other than lumber and basic building materials.
7. Farm products.
8. All commodities.

The index numbers are expressed in terms of the average for the year preceding July 1, 1914, as base.

Figures for the group of all commodities are those of the Bureau of Labor Statistics, which probably give the best indication of the rise in the general price level of any of the various published index numbers.

The lumber series is taken from figures compiled by the Price Section of the War Industries Board. These figures are based on series of quotations from a large number of mills and of a large number of markets in various localities throughout the country. In making this price survey the War Industries Board had the services of lumber experts of the Forest Service of the Department of Agriculture. Their figures form probably the most comprehensive survey of the price situation with regard to the lumber industry during the war period that can be obtained.

The figures for September, 1918, are given because the price level of all commodities reached the maximum point in that month. It may be seen from the table that building materials, not including steel, did not in the first quarter of the current year fall from the level reached in September, 1918, as have the other groups.

Comparison of prices of building materials and of all other commodities.

Table 3 shows that in the last quarter of 1918 building materials prices were 84 per cent above the prewar level, while all other commodities were 113 per cent above the prewar level.

A comparison of the fluctuations of prices of building materials and of all other commodities is shown graphically in Chart I.

In summarizing wartime prices of building materials the Price Section of the War Industries Board has stated:

> The prices of all building materials except steel responded in the main to the same causes of rising wages and materials cost. Building materials, except steel, lagged slightly behind the prices of other commodities because of the abundance of common building materials and the competition between the numerous producers of building materials. Nevertheless, some prices of building materials advanced more rapidly than those of others. Common brick prices, despite the competitive character of

the brick industry, advanced more rapidly than cement. This was due to the fact that the chief cost of producing common brick is labor and that when the demand is not sufficient to cover rising wages cost, the brick manufacturers will close their plants and thereby curtail production and prevent the overstocking of the market. Cement producers, on the other hand, with their high overhead costs are tempted to run their plants at full capacity even though they must lower their prices to sell their entire output. Stone prices exhibited several tendencies. Indiana limestone maintained a high level of prices, but building granite lagged far behind other building materials because of the competition with granite of stone, cement, brick, and hollow tile. Structural steel prices, of course, far outstripped prices of all the building materials because of the heavy demand for steel during the war. In sharp contrast to steel is the price of rubber roofing, which remained almost stationary on account of the relatively low price of rubber during the war. Lumber prices, on the whole, did not rise quite as fast as those of other building materials, but if yellow pine and Douglas fir, the chief building woods, be considered the rise in the price of lumber was almost the same as that of other commodities. Prices of lumber, hollow building tile, and sanitary ware all advanced in proportion to the average rise in the cost of labor and other building materials.

Comparison of prices of lumber and of farm products.

Lumber, as a group, during the last quarter of 1918 was 73 per cent higher than in the prewar year. The farm products group showed an increase of 116 per cent at the same time. The indices show that at the beginning of the year 1919 a farmer could exchange a certain amount of his produce for 25 per cent more of lumber than the same amount of produce would have brought him in the year preceding the war.

Shrinkage of the prewar dollar in terms of commodities.

Chart II shows graphically the increases in price indices of the following four groups: Farm products, lumber, building materials (not including steel), and all commodities other than building materials. The circles in the center of the chart represent the shrinkage of the prewar dollar, expressed in terms of these groups of commodities, the shaded portions representing the residual values of the dollar in terms of these several price levels. Roughly speaking, by the end of 1918 the prewar dollar, as expressed in terms of farm products, had shrunk to 46 cents; as expressed in terms of lumber, it had fallen to 58 cents; in terms of building materials (not including steel), to 54 cents; and in terms of all commodities other than building materials, to 47 cents.

Building materials prices compared with prices of iron and steel products.

A comparison of conditions in the building materials industries and the iron and steel industry is of so much interest that it has been made the subject of the second section of this chapter, where this comparison is presented in some detail.

Prices of individual commodities in the buildings materials group.

Sections VII to XV of this chapter give summaries of the information on production and prices for a great number of individual building materials. For convenience, these individual materials are classified into the following groups: Lumber, iron and steel products used in construction, clay products, quarry products, cement, mineral aggregate, glass, paint materials, and miscellaneous building materials.

A comparison of the rise of prices of various groups of building materials is shown in Chart III.

TABLE 3.—*Comparison of index figures on building materials and other groups of commodities.*

[Figures based on wholesale prices. Base: Average July 1, 1913, to June 30, 1914.]

Period.	1. Lumber.	2. Basic building materials.	3. Lumber and building materials.	4. Construction iron and steel products.	5. All building materials.	6. All other commodities.	7. Farm products.	8. All commodities.
1913	105	101	104	112	105	100	98	100
1914	96	100	97	92	96	99	101	99
1915	94	97	95	102	96	101	103	100
1916	109	115	111	185	122	126	120	123
1917	146	137	143	268	161	180	184	175
1918	173	179	175	242	185	206	214	197
1917:								
First quarter	122	131	125	.....	.....	160	150	155
Second quarter	150	138	146	.....	.....	185	187	179
Third quarter	156	140	150	.....	.....	189	198	184
Fourth quarter	159	140	152	.....	.....	186	203	181
1918:								
First quarter	166	154	162	.....	.....	197	204	187
Second quarter	176	172	175	.....	.....	201	210	192
Third quarter	176	189	180	.....	.....	212	224	202
Fourth quarter	173	203	184	245	193	213	216	205
1918: September[1]	176	198	184	242	193	217	236	207
1919: First quarter	173	203	184	233	191	206	216	200
1919: April	175	200	184	208	189	211	228	203

[1] Month of maximum level for prices of all commodities.

Base: In all cases, average of indices for the year July 1, 1913, to June 30, 1914.
1. Lumber: Index figures of price section of War Industries Board. 2. Basic building materials: Does not include lumber or steel. 3. Lumber and building materials: Does not include steel. 4. Construction iron and steel products: For method of obtaining figures, see Section VIII. 5. All building materials: Weighted averages of figures in series 3 and 4. 6. All other commodities: Figures computed by T. S. Holden from data obtained from Bureau of Labor Statistics. 7. Farm products: Figures of Bureau of Labor Statistics reduced to new base. 8. All commodities: Figures of Bureau of Labor Statistics reduced to new base.

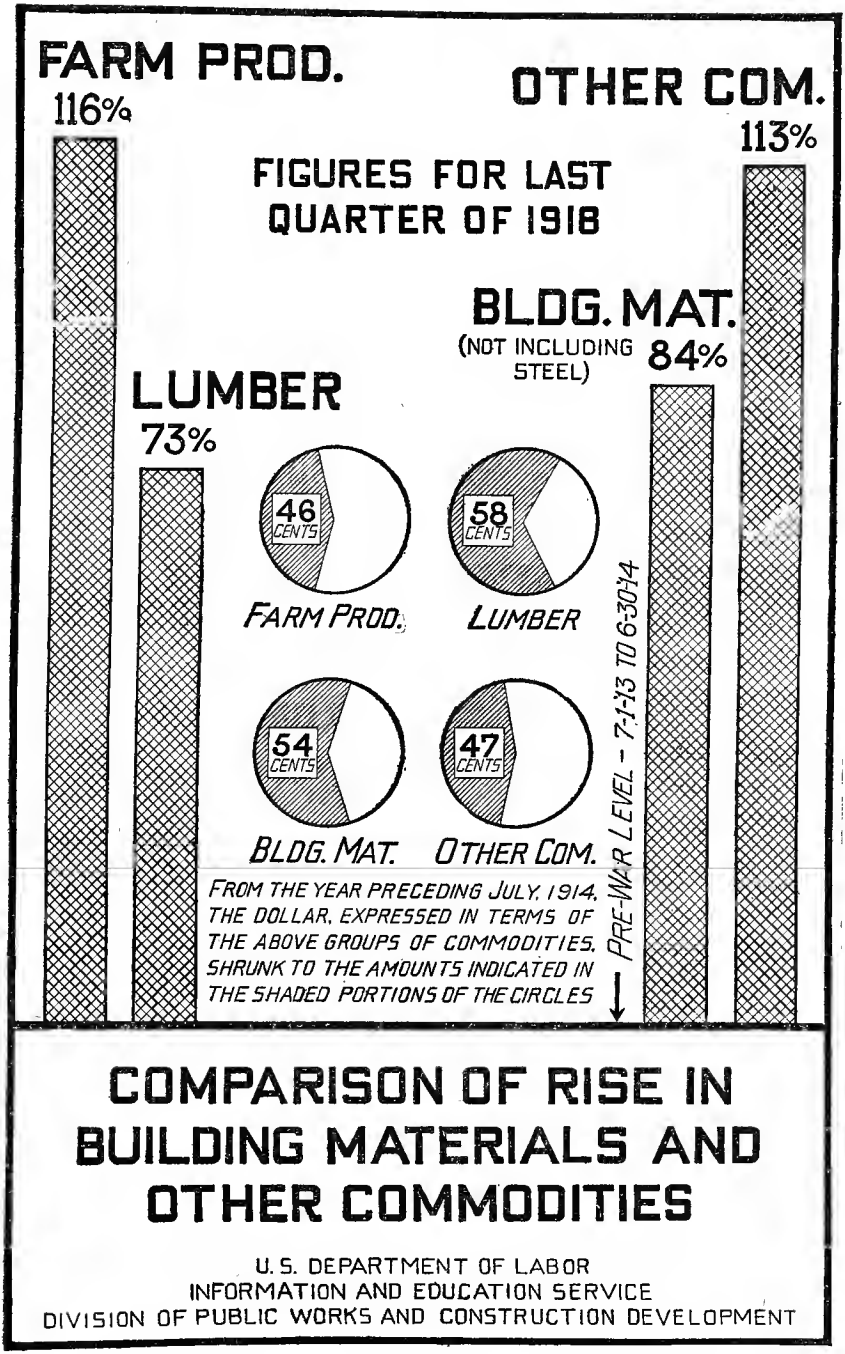

FARM PROD.
116%
OTHER COM.
113%
FIGURES FOR LAST QUARTER OF 1918
BLDG. MAT.
(NOT INCLUDING STEEL)
84%
LUMBER
73%
46 CENTS
FARM PROD.
58 CENTS
LUMBER
54 CENTS
BLDG. MAT.
47 CENTS
OTHER COM.
FROM THE YEAR PRECEDING JULY, 1914, THE DOLLAR, EXPRESSED IN TERMS OF THE ABOVE GROUPS OF COMMODITIES, SHRUNK TO THE AMOUNTS INDICATED IN THE SHADED PORTIONS OF THE CIRCLES
PRE-WAR LEVEL - 7-1-'13 TO 6-30-'14
COMPARISON OF RISE IN BUILDING MATERIALS AND OTHER COMMODITIES
U. S. DEPARTMENT OF LABOR
INFORMATION AND EDUCATION SERVICE
DIVISION OF PUBLIC WORKS AND CONSTRUCTION DEVELOPMENT

CHART II.

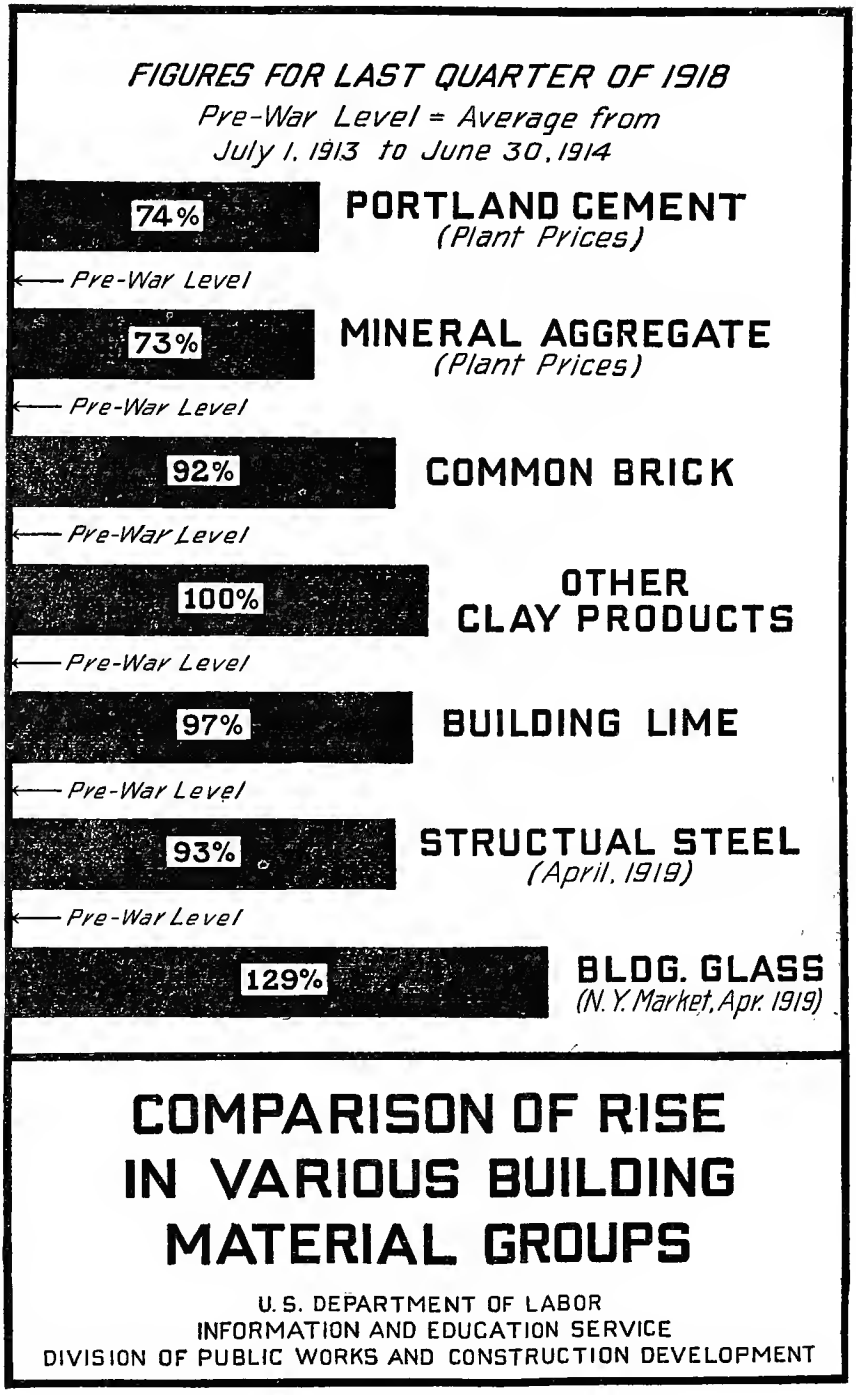

FIGURES FOR LAST QUARTER OF 1918
Pre-War Level = Average from
July 1, 1913 to June 30, 1914
74%
PORTLAND CEMENT
(Plant Prices)
Pre-War Level
73%
MINERAL AGGREGATE
(Plant Prices)
Pre-War Level
92%
COMMON BRICK
Pre-War Level
100%
OTHER
CLAY PRODUCTS
Pre-War Level
97%
BUILDING LIME
Pre-War Level
93%
STRUCTUAL STEEL
(April, 1919)
Pre-War Level
129%
BLDG. GLASS
(N. Y. Market, Apr. 1919)
COMPARISON OF RISE
IN VARIOUS BUILDING
MATERIAL GROUPS
U. S. DEPARTMENT OF LABOR
INFORMATION AND EDUCATION SERVICE
DIVISION OF PUBLIC WORKS AND CONSTRUCTION DEVELOPMENT

CHART III.

SECTION II. COMPARISON OF PRICES OF IRON AND STEEL PRODUCTS WITH PRICES OF BUILDING MATERIALS.

Importance of steel prices in comparison with building material prices.

Prices of steel have been regarded with considerable interest both through the war period and during the period of readjustment. The subject of production and prices of iron and steel is by far too large a one to go into extensively within the scope of this report. Furthermore, the iron and steel products used in construction form only a small part of the total amount of iron and steel products. However, it is of great interest to make a brief survey of the history of the steel industry through the war period by way of contrast with the building materials industry. Various iron and steel products were regarded as essential for winning the war, and production had to be maintained at the highest possible level. On the other hand, the manufacture of building materials was regarded as unessential, and production of these items was specifically curtailed by Government order.

Brief survey of the steel industry through the war period.

The year 1914 was one of the worst in the history of the trade. This is clearly shown in the low prices for that year, which was marked by declining prices, reduced production, slack demand, and poor financial results.

The year 1915 was the year of recovery. War orders for the entente allies began to figure largely, the demands for steel production were greatly increased and prices advanced in the second half of the year.

The year 1916 was the most prosperous in the history of the industry up to that time. Prices advanced considerably, demand increased, and earnings of the companies were very large. Labor also shared in the prosperity, and advances in wages were frequent.

The year 1917 was marked by the entry of this country into the war. It soon developed that a very large proportion of the steel output of the country would be needed for war uses. Prices of steel, iron, and coke soared to unprecedented levels until the Government found it necessary to fix prices on these products. The Government's fixed prices ruled the markets from the last quarter of 1917 until the end of 1918.

War-time production of steel.

Statistics published by the American Iron and Steel Institute in February, 1919, give figures for the production of steel up to and including the year 1917. A comparison of 1917 figures with those for 1913 is of considerable significance. They show an increase of 41 per cent in steel castings; 44 per cent in plates and sheets; 29 per cent in wire rods; 5 per cent in structural shapes; 57 per cent in merchant

bars; 48 per cent in concrete bars; and a reduction of 16 per cent in iron and steel rails. The total production of all grades of pig iron in 1917 was 25 per cent greater than in 1913, and in 1918 30 per cent greater than in 1913; steel-making iron in 1918 was 4 per cent greater in quantity than in 1917.

Steel prices.

A history of steel prices is shown fairly completely in Table 4. Prices advanced rapidly from the second half of the year 1915. With the entry of the United States into the war, the market began to soar. The table shows that on the average finished steel prices in July, 1917, were 3.79 times the figure for the year preceding July, 1914. The month of July, 1917, was the time of the highest steel prices. Prices declined by a small amount until the Government assumed control in November. During the period of Government control, there were some slight fluctuations in the scale of prices. As shown in the table, the index figure at the time of the armistice was 228. The prices fixed by the Government were necessarily high, as the principal desire was to encourage maximum production; this end could be attained only through guaranteeing a fair profit to those producers whose costs were highest.

Early in 1919 the industry announced reductions on various items. This reduction brought the index figure on steel products down to 217. The declines, however, were not considered by the buying public as sufficient to interest them. In February the amount of unfilled orders on the books of the United States Steel Corporation had fallen to a lower figure than for any previous month since October, 1915. Although the buying public did not respond to the declines in prices early in the year, the steel companies adopted a policy of waiting until such a time that further reductions would tend to increase business rather than to encourage the public to wait even longer.

Finally, on March 20, after conference with the Industrial Board of the Department of Commerce, the committee representing the steel companies announced a new schedule of steel prices. The new schedule presented an all-round reduction of $14\frac{3}{4}$ per cent from November, 1918, prices. The index for prices obtaining after the new schedule was announced, is, as shown in Table 4, 195.

Rise in wages in the steel industry.

Figures recently published give the average wages per employee per month paid by the Bethlehem Steel Corporation. These figures show that in 1918 the average earnings received were exactly double the average for 1914. This increase is believed to be typical of the entire industry. It is probable that these figures include a certain proportion of overtime pay, and that the average earnings per month

per employee were somewhat less after the armistice, without any reduction in the wage scale.

On April 9, 1919, a statement was made by Judge Gary, speaking for the United States Steel Corporation, as follows: "For 1913 the direct cost of labor for ore, coal, and stone through to the finished product, inclusive, but exclusive of labor in transportation, was $15.13 per ton, and at present, on the basis of March wage scales, it is $34.61, or an increase of $19.48 per ton."

Early in 1919, at the time the first reductions in steel were made, Judge Gary announced that it was the policy of the United States Steel Corporation to maintain the existing wage scale. On March 20, when the new schedule of steel prices was announced, the committee of steel men stated that the new schedule was the lowest consistent with production costs based on the current wage scale.

Fuel and raw materials prices.

Not only has labor cost increased, but the costs of fuel and of raw materials have gone up along with the other elements of production. The increase in prices of Connellsville coke and iron ore (Messabi, common, non-Bessemer, 51½ per cent) are shown in comparison with the rise in pig iron (basic) in Table 5 and Chart IV. Chart V is appended showing the fluctuations in prices of steel rails (standard, open-hearth).

Comparison of building materials prices with prices of iron and steel.

The comparative figures on the steel products group and the building materials group (not including steel) are shown in the table below:

Comparison of indices on finished steel products and building materials (not including steel).

	Steel products.	Building materials.
July 1, 1913, to June 30, 1914	100	100
July, 1917	379	a 150
November, 1918	228	183
Mar. 1, 1919	217	184
Mar. 25, 1919	195	184

a Figure for third quarter, 1917.

There was this difference in the conditions that determined prices on steel and on basic building materials: In the case of materials regarded as not essential, such as most of the building materials other than steel, the price whether fixed by the Government or in the open market, was not sufficiently high to keep all producers in the market, simply because the maximum production was not required by the war-time needs of the country. In fact construction

itself, as well as production of various building materials, was specifically curtailed by governmental order.

Figures of the United States Geological Survey show that actual production of common lime in 1918 was 20 per cent less than in 1917. Portland cement produced in 1918 was 23 per cent under the 1917 figure. Lumber production in 1918 was 10 per cent less than in 1917 and 19 per cent less than in 1916. Common brick in 1917 was 21 per cent under 1916. It has been estimated that in 1918 the production of common brick was less than half the 1917 figure.

As a consequence, the markets have been understocked rather than overstocked in these commodities. If any one of these commodities had been considered as essential as steel, the Government would have been obliged to fix the prices on them at figures high enough to encourage every producer in the country to run his plant at maximum capacity with a guarantee of a reasonable profit on his output. In that case the prices on these commodities would have reached much higher levels than they actually did.

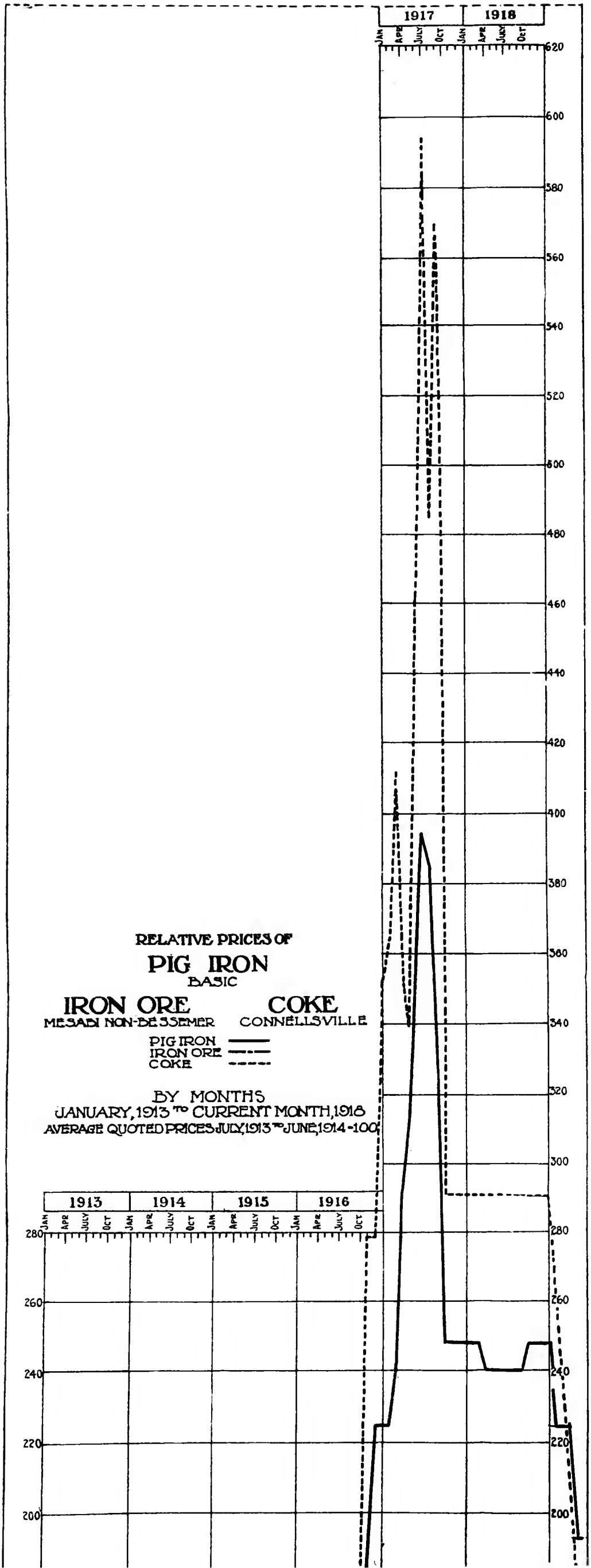
Iron and steel products used in construction.

Iron and steel products used in construction are considered in Section VIII of this chapter, together with some figures on the increase in freight rates on pig iron and finished steel.

TABLE 4.—*Prices of iron and steel products.*

[Prewar prices=average July 1, 1913, to June 30, 1914.]

Commodity.	Prewar price.	July, 1917.	November, 1918.	Mar. 1, 1919.	Mar. 25, 1919.
1. Pig iron, basic:					
Quoted, per long ton	$13.3183	$52.50	$33.00	$30.00	$25.75
Relative	100	394	248	225	193
2. Billets, 4-inch:					
Quoted, per long ton	$21.8333	$95.00	$47.50	$43.50	$38.50
Relative	100	435	218	199	176
3. Sheet bars:					
Quoted, per long ton	$22.6750	$105.00	$51.00	$47.00	$42.00
Relative	100	463	225	207	185
4. Skelp, grooved:					
Quoted, per hundredweight	$1.26	$6.00	$2.90	$2.70	$2.45
Relative	100	476	230	214	194
5. Merchant bars, base:					
Quoted, per hundredweight	$1.26	$4.50	$2.90	$2.70	$2.35
Relative	100	357	230	214	187
6. Plates, tank:					
Quoted, per hundredweight	$1.26	$9.00	$3.25	$3.00	$2.65
Relative	100	714	258	238	210
7. Structural steel, base:					
Quoted, per hundredweight	$1.2675	$4.50	$3.00	$2.80	$2.45
Relative	100	356	237	221	193
8. Wire rods:					
Quoted, per long ton	$25.2083	$96.25	$57.00	$57.00	$52.00
Relative	100	382	226	226	206
9. Plain wire:					
Quoted, per hundredweight	$1.4125	$3.95	$3.25	$3.25	$3.00
Relative	100	280	230	230	212
10. Nails, wire:					
Quoted, per hundredweight	$1.5975	$4.00	$3.50	$3.50	$3.25
Relative	100	250	219	219	204
11. Black sheets, No. 28:					
Quoted, per hundredweight	$1.98	$8.00	$5.00	$4.70	$4.35
Relative	100	404	253	237	220


1917
1918
JAN
APR
JULY
OCT
620
600
580
560
540
520
500
480
460
440
420
400
380
360
340
320
300
280
260
240
220
200
RELATIVE PRICES OF
PIG IRON
BASIC
IRON ORE
MESABI NON-BESSEMER
COKE
CONNELLSVILLE
PIG IRON
IRON ORE
COKE
BY MONTHS
JANUARY, 1913 TO CURRENT MONTH, 1918
AVERAGE QUOTED PRICES JULY, 1913 TO JUNE, 1914 - 100
1913
1914
1915
1916

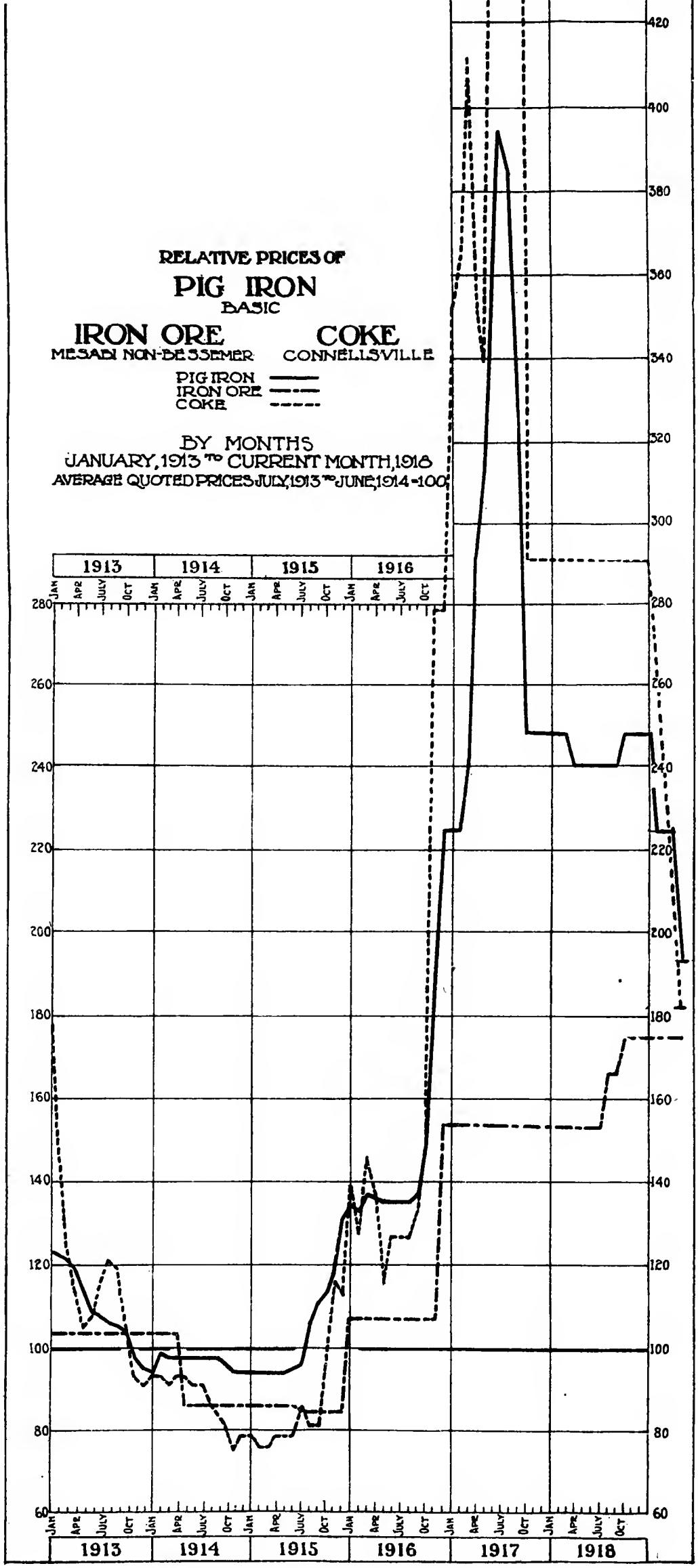


Chart furnished through courtesy of Price Section, War Industries Board.

CHART IV.

121297°—19. (To face page 52.)

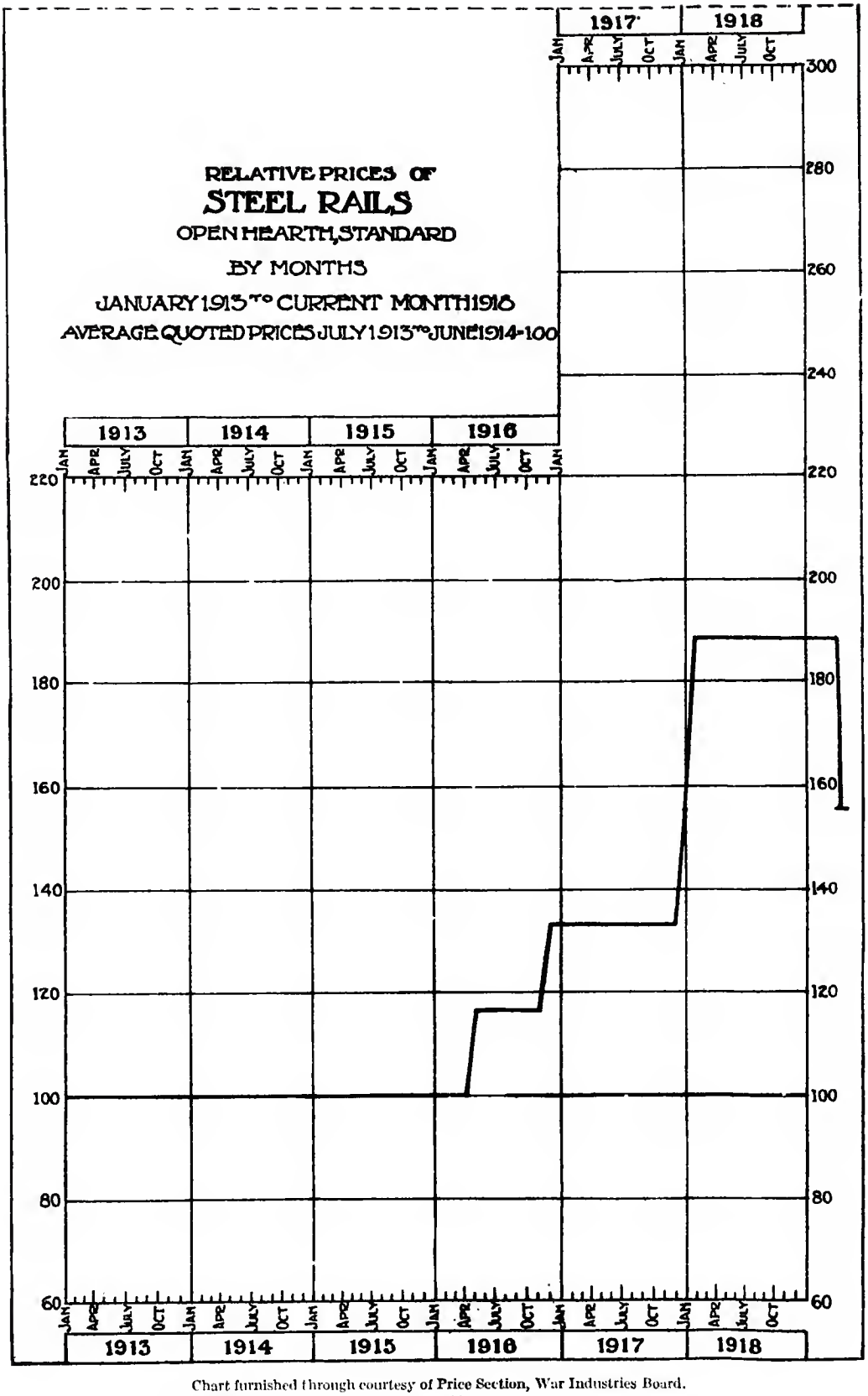


Chart furnished through courtesy of Price Section, War Industries Board.
Chart V.

121297°—19. (To face page 53.)

TABLE 4.—*Prices of iron and steel products*—Continued.

Commodity.	Prewar price.	July, 1917.	November, 1918.	Mar. 1, 1919.	Mar. 25, 1919.
12. Sheets, blue annealed, No. 10:					
Quoted, per hundredweight	$1.4983	$8.25	$4.25	$3.90	$3.55
Relative	100	551	284	261	237
13. Galvanized sheets, No. 28:					
Quoted, per hundredweight	$2.9858	$10.50	$6.25	$6.05	$5.70
Relative	100	352	209	202	191
14. Tin plate, 14 by 20 inches:					
Quoted, per hundredweight	$3.4375	$12.00	$7.75	$7.35	$7.00
Relative	100	349	225	214	204
15. Hoops, base:					
Quoted, per hundredweight	$1.3917	$5.50	$3.50	$3.30	$3.05
Relative	100	395	251	237	219
16. Rails, Stand. Bessemer:					
Quoted, per long ton	$28.00	$38.00	$55.00	$55.00	$45.00
Relative	100	136	196	196	161
17. Rails, Stand. O-H:					
Quoted, per long ton	$30.1467	$40.00	$57.00	$57.00	$47.00
Relative	100	133	189	189	156
Weighted average of finished steel products	100	379	228	217	195

Authorities: All except Nos. 7 and 10 from Bulletin No. 5, price section, War Industries Board, November 1918; later figures from the Iron Age; Nos. 7 and 10 from the Iron Age.

TABLE 5.—*Comparison of prices on iron ore, coke, and pig iron.*

Period.	1. Iron ore.		2. Coke.		3. Pig iron.	
	Price per ton.	Relative price.	Price per short ton.	Relative price.	Price per long ton.	Relative price.
Base	$3.3083	100	$2.0625	100	$13.3183	100
1913	3.4000	103	2.4396	118	14.7058	110
1914	3.0333	92	1.8083	88	12.8733	97
1915	2.8250	85	1.7854	87	13.7408	103
1916	3.6750	111	3.2458	157	19.7600	148
1917, by quarters:						
First	5.0500	153	7.7500	376	30.6923	230
Second	5.0500	153	7.9167	384	42.9231	322
Third	5.0500	153	11.3333	549	49.0000	368
Fourth	5.0500	153	6.0000	291	33.0000	248
1918, by quarters:						
First	5.0500	153	6.0000	291	33.0000	248
Second	5.0500	153	6.0000	291	32.0000	240
Third	5.3500	162	6.0000	291	32.0000	240
Fourth	5.7500	174	6.0000	291	33.0000	248
1919, by months:						
January	5.7500	174	5.6500	274	30.0000	225
February	5.7500	174	4.4400	215	30.0000	225
March 11	5.7500	174	4.1250	200	30.0000	225
March 27	5.7500	174	4.0000	194	27.8750	209

1. Iron ore, Mesabi, non-Bessemer, 51½ per cent; market, Lower Lake Ports; source, Iron Trade Review, 2. Coke, Connellsville, furnace; market, f. o. b. ovens; source, The Iron Age. 3. Pig iron, basic; market, Mahoning or Shenango Valley Furnace; source, The Iron Age.

Base: In all cases base equals average of prices from July 1, 1913, to June 30, 1914.

SECTION III. COMPARISON OF WAR PRICES IN AMERICA AND CERTAIN FOREIGN COUNTRIES.

Explanation of tables.

Tables 6 and 7 show the index figures of the United States Bureau of Labor Statistics, the Canadian Labor Department, the London Economist, and the Statistique Générale of France. In these tables all the indices are expressed as percentages of the 1913 average.

It should be understood that these different series of figures are not absolutely comparable, since there is considerable variation in the number of commodities included in the different series, and also since there is considerable variation in the methods used for obtaining these average figures.

However, these figures do give a concrete indication of the trend of wholesale prices in these countries, and comparison of the figures for the several countries does bring out certain facts of considerable significance.

There are at hand some figures on Australia, taken from the Commonwealth Bureau of Census and Statistics, the indices being averaged from wholesale prices of 92 commodities. These figures, being incomplete, are not included in the tables.

The six tables (8 to 13) showing comparisons of actual prices in the United States and foreign countries have been based on quotations furnished to this division by the price section of the War Industries Board. These quotations have been reduced to quotations in terms of American money. In the case of each quotation the change to American money was based on the actual rate of exchange that prevailed during the period in question.

The great preponderance of prices of iron and steel products is explained by the fact that more quotations were available on these commodities than on other building materials. While no foreign quotations are available for 1919, it is unlikely that there have been considerable reductions, if any at all. In this connection, the reductions in prices of American steel products that have taken place in 1919 should be considered.

A comparison of indices.

As might be expected, the countries nearest the scene of actual warfare show greater rises in the price level than have been evident in this country. It was also to be expected that the rises would begin earlier in the European countries than they did in this country. The figures for 1915 show a 40 per cent increase for France, 23 per cent for England, 10 per cent for Canada, while the price level in this country remained the same as for the year 1913. However, this country began to feel the influence of war conditions early in the year 1916, more than a year before we became an active belligerent.

The Australian index for the first quarter of 1918 was 173, as compared with 187 in this country, 194 in Canada, 216 in England, and 320 in France. It is not surprising that the general level of prices should be affected in less degree in Australia than in other countries.

Maximum levels reached.

The highest point, 207, was reached in this country in September, 1918. In Canada, the November, 1918, figure, 215, is the maximum. Great Britain reached the maximum in August, 1918, the index then being 233. Of the figures available for France at the time that Chart VI was made, the greatest is the one for May, 1918, 335. Figures obtained later showed the maximum for France, 360, to have been reached in October, 1918.

These maximum price levels are shown graphically in the accompanying chart.

It is significant that France, which resorted to inflation more extensively than did either England or the United States, experienced a considerably larger increase in the general price level.

Prices in Great Britain.

Although each set of figures is referred to the 1913 figure of the particular country in question as base, it is impossible to say that a comparison of indices indicates more than the trend in the respective countries. If the figures of the London Economist and those of the United States Bureau of Labor Statistics were entirely comparable, then the indices for March, 1918, would show that prices for England, on the average, were 7 per cent higher than in this country.

Perhaps this figure is somewhere near the correct indication of the difference in prices in the two countries. It is known that prices on a number of commodities were higher in England at the beginning of the year 1919 than they were in the United States.

It was stated early in 1919 that prices on steel products ran from 5 to 40 per cent higher in England than in this country. That was before the reductions announced in this country in March.

In the middle of the month of March there appeared statements in the daily press to the effect that the United States Army had been offered for certain supplies held in England higher prices than had been paid for them under war conditions.

About May 1, 1919, it was stated in the press that the city of Birmingham, England, had placed orders for steel rails in the United States on account of more favorable prices and conditions of delivery.

The British Ministry of Reconstruction has issued a pamphlet stating that while it expected that prices would recede somewhat from war-time levels it was out of the question that they should fall to anything like the 1914 level in the near future.

In the same pamphlet the causes assigned for the great increase of prices are reduced output, increased freight rates, limitation of imports, and issuance of paper money.

Prices of building materials in Great Britain.

The information at hand on building materials in the British markets is rather meager. The commodities comprised in the London Economist index figure do not include a building-materials group. It has been stated, however, on good authority that on the average the cost of building materials in England early in the year 1919 was more than double the prewar figure. This would indicate that building materials in the English markets have risen to practically the same levels as other commodities.

The increase of more than 100 per cent indicated in the above statement, compared with an increase in this country of only 84 per cent, shows that the buyer of building materials in England is to-day in a worse situation than the American buyer is.

Some figures given in the report of a special investigating committee of the British Government shows that as early as November 2, 1915, certain building materials showed very marked increases over the prices obtaining at the outbreak of the war. These figures are given in the following table:

Percentage of increase in prices of building materials in Scotland, from outbreak of war to Nov. 2, 1915.

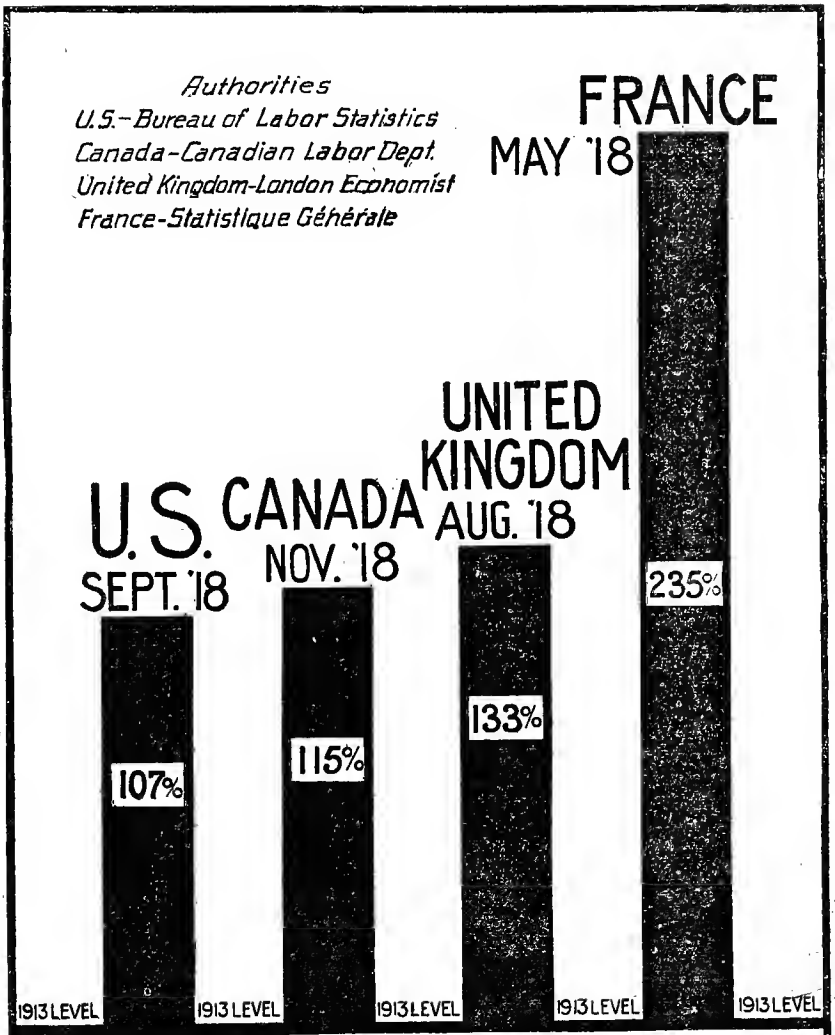
Material.	Increase.	Material.	Increase.
	Per cent.		*Per cent.*
Lime	5	Iron	50–100
Cement	75	Fire clay	50
Brick	25	Galvanized tanks	75
Wood	110	Wall paper	25
Zinc	200	White lead	100
Lead	100	Oils	20–30

The building industry in Great Britain after the war.

Great Britain's housing needs at the close of the war have been variously stated, the estimates running all the way from 300,000 to 500,000 houses. The Government is making its plans for a national house-building project. subsidized by the State under arrangement with various local governments. It is considered necessary for the Government to assume part of the risk of declining prices, for otherwise private builders would hesitate to buy materials at prevailing figures.

It was ascertained by a committee appointed by the Minister of Reconstruction in Great Britain [1] that sufficient building material

[1] Report of the Committee appointed by the Minister of Reconstruction to consider the position of the building industry after the war. London, 1918, 13 pp. (c. d. 9197).



* Price level in France showed increase of 260 per cent in October, 1918.

CHART VI.

would not be available in that country to adequately meet the demand after the war. This fact, the committee stated, would require a certain measure of control. The policy of control contemplated was one which would fairly equalize supply and demand and guarantee that works of national importance should receive essential supplies.

The committee did not propose to regulate prices. The principal means of regulation advocated related to the labor situation and the form of taxation.

The increase in the production of building materials was to be secured in various ways, among which are the following:

1. Priority of demobilization for men engaged in the professions and trades concerned in the building industry.
2. Similar priority of demobilization of men required for the production of building materials.
3. Immediate provision of labor which is available for the making of standard bricks.
4. Immediate facilities for repairs, renewals, and restoration of building materials establishments.
5. Immediate release from Government control of brickyards and premises now occupied for storage.
6. The securing of adequate supplies of fuel and raw materials.
7. The scrapping of inefficient plants and introduction of more modern appliances and increased use of machinery.
8. The use of local materials wherever possible.
9. Institution of scientific and industrial research in the respective trades.
10. Financial assistance by the State in the extensions and equipment of work.
11. Closer cooperation between employers and employees, such as may be secured by the joint industrial committees.
12. Early placing of contracts wherever possible for postwar delivery of materials, such as brick, stone, etc., in order to establish confidence in the various trades by the knowledge of a sufficiency of work for some time in advance.
13. Standardization of fittings in all trades, such as doors, sashes, windows, hardware, and the like; and, finally,
14. Immediate steps should be taken for the importation of 100,000 standards, 198,000 M a month, of softwood in the first year after the war.

The report suggests a rather elaborate machinery for the purpose of attaining the ends desired, with a system consisting of a central committee, regional committees, and field agents, the personnel of the committees to be made up of architects, civil engineers, surveyors, employers, manufacturers, distributors, and workmen.

With reference to the causes of unduly high prices and the methods of controlling these, it was suggested that these matters would tend to regulate themselves by increasing the building productivity of the country. As a means of increasing the building production of the country there was the increasing demand for workmen's houses. The committee, however, looked upon the building of workmen's houses merely as a supplementary means of steadying the demand for labor and building material.

Later reports from England state that the Government has agreed to guarantee all those who build houses in 1919 against decline in materials prices for a period of five years to the extent of 75 per cent of the depreciation in value of the buildings caused by such decline. It has also been stated that the Government does not expect any marked declines to take place during that period.

Conclusions from study of foreign prices.

This brief survey of foreign prices shows that the great rise in prices during the war was a world-wide phenomenon. In all the countries studied the rise in prices has been accompanied by a great increase in the amount of money and credit instruments in circulation. The fact that prices have risen all over the world makes it extremely unlikely that they will return to prewar levels for a considerable period of years, if ever.

One large element in the rise of prices in the European countries was the great difficulty of importing raw materials under the conditions of war. With the signing of the peace treaty and the resumption of trade relations between nations on a normal basis, this difficulty should be, to a large extent, removed. That should tend to reduce the price levels in those countries somewhat. But America, having suffered less under this difficulty, will benefit less by its removal.

The very fact that the increases were so much greater in England and France than in this country would lead one to expect greater proportional declines. This has actually been the case in the period following the attainment of the maximum levels in this country and in England. From August, 1918, to February, 1919, the price index of the London Economist fell 7.5 per cent. Dun's index figures indicate a drop in the price level in this country of 5.7 per cent from September 1, 1918, to March 1, 1919. The Bureau of Labor Statistics figures indicate a drop of only 3.4 per cent for the same period. In this country, after March 1, 1919, commodity prices in general have reacted upward.

TABLE 6.—*Wholesale prices in the United States and certain foreign countries.*

[Index numbers expressed as percentages of the index number for 1913.]

	Yearly averages.			
	1. United States.	2. Canada.	3. Great Britain.	4. France.
1913	100	100	100	100
1914	99	100	99	102
1915	100	110	123	140
1916	123	134	160	188
1917	175	174	204	262
1918	196	205	225	339

	Commodities.
1. From Bureau of Labor Statistics	294
2. From Canadian Department of Labor	272
3. From the London Economist	44
4. From the Statistique Générale	45

TABLE 7.—*Wholesale prices in the United States and certain foreign countries.*

[Index numbers expressed as percentages of the index number for 1913.]

	Quarterly averages.			
	1. United States.	2. Canada.	3. Great Britain.	4. France.
1914:				
First quarter	100	100	a 97	100
Second quarter	98	100	a 96	100
Third quarter	101	100	a 95	101
Fourth quarter	98	102	a 101	107
1915:				
First quarter	99	a 103	a 112	124
Second quarter	99	a 108	a 124	135
Third quarter	100	a 111	a 122	142
Fourth quarter	103	a 112	a 125	158
1916:				
First quarter	112	a 127	a 143	179
Second quarter	117	a 132	a 156	190
Third quarter	123	a 132	a 156	186
Fourth quarter	141	a 138	a 171	198
1917:				
First quarter	155	159	190	223
Second quarter	179	175	204	257
Third quarter	184	180	209	273
Fourth quarter	181	183	214	292
1918:				
First quarter	187	194	216	320
Second quarter	192	203	224	332
Third quarter	203	210	231	347
Fourth quarter	204	214	227	357
1919:				
January	202	211	217	349
February	197	206	215	.....
March	200	.....	212	.....
Highest level	207 (Sept. '18)	215 (Nov. '18)	233 (Aug. '18)	360 (Oct. '18)

a Figures for first month of each quarter.

TABLE 8.—*Comparison of foreign and domestic prices on pig iron.*

Country	United States.	England.	Australia.	Germany.		Denmark.
Market	M. or S. Valley Furnace.	London and Manchester.	Melbourne.	Dortmund.	Dortmund.	Copenhagen.
Grade	Basic.	Good marked bars.	.....	German.	German Bessemer from Oberhauser.	Rhenish.
Unit	Short ton.	Ton.	Short ton.	Short ton.	Short ton.	Short ton.
Source	Labor statistics from the Iron Age.	The Economist.	Australian Hardware and Machinery.	Vierteljahrshefte zur Statistik des Deutschen Reiches, Berlin.	Vierteljahrshefte zur Statistik des Deutschen Reiches, Berlin.	United States consul general, Copenhagen.
Base: (July 1, 1913, to June 30, 1914)	$11.89	$12.68	$23.927	$13.53	$17.44	$24.75
1913:						
First quarter	14.53	15.64	21.90	14.25	17.82	.....
Second quarter	13.55	15.42	24.33	14.25	17.82	26.99
Third quarter	12.63	13.56	25.55	14.25	17.82	24.83
Fourth quarter	11.82	12.54	25.55	13.96	17.60	24.83
1914:						
First quarter	11.52	12.26	23.12	12.96	17.17	24.83
Second quarter	11.61	12.40	21.39	12.96	17.17	24.47
Third quarter	11.61	13.55	23.29	13.09	17.49	25.97
Fourth quarter	11.25	12.18	23.40	13.11	17.62	25.51
1915:						
First quarter	11.16	13.50	22.98	13.30	19.20	24.76
Second quarter	11.19	15.84	22.78	12.99	18.83	25.69
Third quarter	12.37	15.94	22.58	14.31	21.65	27.02
Fourth quarter	14.36	16.44	23.24	13.56	21.38	26.68
1916:						
First quarter	15.98	19.44	24.25	.....	.....	27.73
Second quarter	16.11	19.80	28.17	.....	.....	30.49
Third quarter	16.16	21.00	32.54	.....	.....	34.91
Fourth quarter	22.32	21.00	41.10	.....	.....	41.03
1917:						
First quarter	27.41	21.00	44.40	.....	.....	43.01
Second quarter	38.33	22.20	.....	.....	.....	49.11
Third quarter	43.76	22.20	.....	.....	.....	52.15
Fourth quarter	29.47	22.20	.....	.....	.....	58.89
1918:						
First quarter	29.47	22.80	.....	.....	.....	62.26
Second quarter	28.58	22.80	.....	.....	.....	62.26
Third quarter	28.58	22.80	.....	.....	.....	73.58
Fourth quarter	29.47	.....	.....	.....	.....	.....
Per cent increase (final figure over base price)	147.8	79.8	85.6	0.002	0.225	197

Foreign quotations are from price section, War Industries Board. They have been reduced to quotations in terms of American money, the average rate of exchange prevailing during the period in question being used in each case.

TABLE 9.—*Comparison of foreign and domestic prices on steel products.*

Commodity	Structural steel.		Galvanized corrugated iron.[1]	Plates, shapes, and bars.						
Country	United States.	France.	Australia.	United States.			England.		France.	Denmark.
Market	Pittsburgh.	Paris.	Melbourne.	Pittsburgh.	Philadelphia.	Pittsburgh.	Staffordshire.	London and Manchester.	Paris.	Copenhagen.
Grade	Steel beams.	Structural iron.	Galvanized corrugated.	Steel tank plates.	Iron bars, best refined.	Steel bars, base price.	Iron bars unmarked South Staffordshire.	Iron bars Welsh ports.	Merchant bars No. 2.	Shipbuilding material—German.
Unit	Short ton.	Short ton.	Short ton.	Short ton.	Short ton.	Short ton.	Short ton.	Short ton.	Short ton.	Short ton.
Source	The Iron Age.	Reforme Economique.	Australian Hardware and Machinery.	Metal Statistics and Steel and Metal Digest.	Labor statistics from American Iron and Steel Institute and Iron Mercantile Association.	Metal Statistics American Metal Market.	Rylands Weekly.	The Economist.	Reforme Economique.	United States consul general Copenhagen.
Base (July 1, 1913, to June 30, 1914)	$25.35	$39.08	$92.46	$25.20	$36.00	$25.20	$34.42	$37.20	$33.21	$26.72
1913:										
First quarter	34.40	43.53	92.05	29.33	41.20	28.00	41.87	37.20	38.67	29.22
Second quarter	30.80	40.57	94.89	29.00	39.20	28.00	43.52	37.20	36.26	23.27
Third quarter	28.80	39.83	92.46	28.60	38.60	28.00	37.97	37.20	35.80	23.27
Fourth quarter	26.00	39.20	92.46	25.66	34.60	26.06	34.63	37.20	35.32	23.38
1914:										
First quarter	24.00	38.53	92.46	23.93	33.20	24.13	33.31	37.20	30.94	24.89
Second quarter	22.60	38.53	92.46	22.60	31.40	22.73	31.69	37.20	30.65	24.89
Third quarter	23.40	40.70	107.48	23.20	32.60	23.26	39.00	40.92	32.38	24.89
Fourth quarter	22.20	.....	101.00	21.86	30.40	22.06	37.47	37.20	31.22	24.89
1915:										
First quarter	22.00	.....	.....	22.33	30.40	22.33	38.92	37.60	.....	28.55
Second quarter	24.00	.....	129.47	23.46	31.40	24.00	47.30	37.20	.....	33.54
Third quarter	26.00	.....	149.77	25.40	34.80	26.03	55.04	37.20	.....	41.13
Fourth quarter	32.20	.....	143.40	32.00	43.00	32.06	57.43	37.20	.....	46.22

1916:										
First quarter	42.40	.....	159.42	43.93	57.40	41.93	64.53	46.40	.....	54.87
Second quarter	51.20	.....	174.21	56.53	63.80	50.00	65.65	65.60	.....	66.48
Third quarter	51.00	.....	179.38	58.93	65.60	51.06	65.45	69.60	.....	72.29
Fourth quarter	59.00	116.61	180.26	66.20	74.40	55.40	65.18	71.60	.....	96.49
1917:										
First quarter	67.00	116.52	193.47	77.93	82.60	61.80	65.45	72.00	116.60	130.49
Second quarter	81.20	124.60	223.56	107.33	92.00	73.53	65.45	72.00	130.68	134.99
Third quarter	85.40	136.13	.....	166.73	110.00	85.86	65.45	72.00	134.49	153.28
Fourth quarter	60.00	146.11	.....	65.00	94.60	58.00	65.45	72.00	134.49	234.57
1918:										
First quarter	60.00	153.28	.....	65.00	90.00	58.00	65.65	66.00	137.58	200.08
Second quarter	60.00	153.28	.....	65.00	90.00	58.00	66.05	66.20	134.95	206.16
Third quarter	60.00	.....	.....	65.00	94.20	58.00	67.43	68.00	.....	208.05
Fourth quarter	59.40	.....	.....	64.20	118.20	57.33	70.15	70.12	.....	.....
Percentage increase (final figure over base price)	134	293	142	155	228	128	104	88	306	679

[1] See Table No. 5.

Foreign quotations are from Price Section, War Industries Board. They have been reduced to quotations in terms of American money, the average rate of exchange prevailing during the period in question being used in each case.

TABLE 10.—*Comparison of foreign and domestic prices on sheet steel.*

Country	United States.			England.			Australia.		France.	Denmark.
Market	Pittsburgh.	Pittsburgh.	F. o. b. mill, Pittsburgh.	Delivered on job.	Delivered on job.	Delivered on job.	Melbourne.	Melbourne.	Paris.	Copenhagen.
Grade	Blue annealed No. 10 gauge.	Black No. 28 guage.	Galvanized No. 28 gauge.	Mild Siemans soft steel.	Galvanized, flat annealed, 18 gauge South Wales.	Doubles, South Staffordshire.	Galvanized, plain.[1]	Black.	Black.	Siemans Martin, Swedish.
Unit	Short ton.	Short ton.	Short ton.	Ton.	Ton.	Ton.	Short ton.	Short ton.	Short ton.	Short ton.
Source	Metal Statistics and Steel and Metal Digest.	Metal Statistics and Steel and Metal Digest.	Metal Statistics and Steel and Metal Digest.	Rylands to July, 1915; Iron and Steel Trade Journal after July, 1915.	Rylands's weekly.	Rylands's weekly.	Australian Hardware and Machinery.	Australian Hardware and Machinery.	Reforme Economique.	United States consul, Copenhagen.
Base (July 1, 1913, to June 30, 1914)	$29.97	$39.60	$59.71	$36.22	$54.95	$39.39	$102.20	$55.96	$41.01	$40.03
1913:										
First quarter	34.66	46.80	69.80	40.99	59.12	44.10	102.19	55.96	44.75	.....
Second quarter	35.00	46.60	68.20	40.99	57.20	44.10	102.19	55.96	42.99	40.12
Third quarter	33.70	43.80	64.86	40.19	55.57	43.29	102.19	55.96	42.03	40.12
Fourth quarter	30.60	39.13	59.40	35.43	54.07	38.42	102.19	55.96	41.43	40.12
1914:										
First quarter	28.00	38.40	58.40	34.63	55.96	38.02	102.19	55.96	40.28	40.12
Second quarter	27.46	37.06	56.20	34.63	54.26	38.02	102.19	55.96	40.28	39.71
Third quarter	27.40	37.73	57.26	42.77	66.73	45.90	112.86	64.49	42.56	42.36
Fourth quarter	27.72	37.80	57.60	41.26	62.19	44.65	109.63	64.05	41.03	44.18
1915:										
First quarter	26.00	36.00	61.93	42.35	63.90	45.47	106.04	64.50	.....	42.39
Second quarter	26.72	35.73	78.66	48.60	83.49	50.60	122.28	64.74	.....	48.91
Third quarter	28.00	36.66	84.86	54.54	100.63	54.15	156.90	76.07	.....	59.26
Fourth quarter	38.40	45.73	82.60	61.75	100.82	59.79	152.83	86.65	.....	64.81
1916:										
First quarter	53.66	52.86	96.53	62.54	131.57	79.35	174.12	116.88	.....	67.54
Second quarter	59.66	57.93	98.66	84.49	137.70	86.87	179.37	149.20	.....	100.37
Third quarter	58.00	58.06	85.33	84.49	137.25	86.87	184.12	152.37	.....	103.09
Fourth quarter	67.80	75.66	107.40	84.72	137.52	89.11	185.00	151.80	.....	128.96

1917:										
First quarter	89.66	93.53	135.00	85.08	137.92	92.82	198.13	152.23	128.68	156.63
Second quarter	134.00	134.06	174.33	85.28	137.92	92.82	237.82	221.96	142.11	159.00
Third quarter	161.66	160.00	204.00	86.87	137.92	92.82	.....	304.37	157.36	260.54
Fourth quarter	107.86	115.86	143.46	86.87	133.61	85.68	.....	332.68	156.27	320.71
1918:										
First quarter	85.00	100.00	125.00	86.87	134.62	85.68	.....	332.75	149.28	237.04
Second quarter	85.00	100.00	125.00	86.87	137.92	85.68	.....	335.23	149.28	244.21
Third quarter	85.00	100.00	125.00	86.87	137.92	84.89	.....	335.34	.....	215.53
Fourth quarter	85.00	100.00	125.00	86.98	137.92	83.23	.....	.....	.....	.....
Percentage increase, final figure over base price	183	153	109	140	151	111	132	499	264	438

[1] See Table No. 4.

Foreign quotations are from Price Section, War Industries Board. They have been reduced to quotations in terms of American money, the average rate of exchange prevailing during the period in question being used in each case.

TABLE 11.—*Comparison of foreign prices with American prices.*

Commodity	Steel rails.			Hoop steel.		Nails.		
Country	United States.	United States.	England.	United States.	England.	United States.	Australia.	Japan.
Market	Pittsburgh.	Pittsburgh.	London and Manchester.	Pittsburgh.	England.	Pittsburgh.	Melbourne.	Yokohama.
Grade	Open-hearth standard.	Bessemer standard.	Standard heavy rails.	Steel boops.	Cut, South Staffordshire.	Wire, base price.	Wire nails.	Nails, foreign.
Unit	Gross ton.	Gross ton.	Gross ton.	Short ton.	Ton.	Short ton.	Short ton.	Ton.
Source	Labor statistics from Iron Trade Review.	Labor statistics from Iron Trade Review.	The Economist.	Metal Statistics and American Metal Market.	Ryland's Weekly.	The Iron Age, Jan. 2, 1919.	Australian Hardware and Machinery.	Chamber of Commerce Journal, Yokohama.
Base (July 1, 1913 to June 30, 1914)	$30.1467	$28.0000	$31.87	$27.83	$37.36	$31.95	$100.26	$54.99
1913:								
First quarter	30.016	28.0000	32.20	31.67	42.53	35.00	102.18	55.74
Second quarter	30.016	28.0000	32.40	32.00	42.11	36.00	94.88	55.35
Third quarter	30.0907	28.0000	32.20	31.33	40.48	33.40	94.88	55.35
Fourth quarter	30.2400	28.0000	31.20	29.33	37.86	31.80	94.88	54.54
1914:								
First quarter	30.2400	28.0000	31.20	25.67	35.02	31.60	105.70	52.94
Second quarter	30.0160	28.0000	31.20	25.00	35.23	31.00	105.70	52.34
Third quarter	30.0160	28.0000	32.34	25.67	39.63	31.20	118.80	55.06
Fourth quarter	30.0160	28.0000	31.20	25.00	39.41	30.80	101.18	56.27
1915:								
First quarter	30.0160	28.0000	31.60	24.93	40.92	31.40	98.00	56.27
Second quarter	30.0160	28.0000	36.00	26.00	49.95	31.00	118.40	72.57
Third quarter	30.0160	28.0000	41.60	27.07	55.47	32.60	119.80	81.90
Fourth quarter	30.0160	28.0000	43.20	35.13	62.59	38.00	104.00	113.77
1916:								
First quarter	30.0000	28.0000	52.40	46.73	80.01	45.00	116.20	128.41
Second quarter	31.6667	29.0000	52.20	55.53	84.52	49.40	168.20	133.28
Third quarter	35.0000	33.0000	54.00	57.47	84.90	51.20	171.40	128.34
Fourth quarter	36.6667	34.6667	54.00	64.07	85.38	56.00	170.80	141.87

1917:								
First quarter	40.0000	38.0000	54.00	75.00	90.38	61.40	171.40	128.41
Second quarter	40.0000	38.0000	53.40	85.00	90.38	70.20	226.00	140.10
Third quarter	40.0000	38.0000	54.00	106.53	90.38	80.00	249.80	190.74
Fourth quarter	40.0000	38.0000	54.00	88.60	90.38	73.40	249.80	218.10
1918:								
First quarter	53.0769	51.0769	52.20	70.00	90.31	70.00	257.60	204.71
Second quarter	57.0000	55.0000	52.20	70.00	90.34	70.00	261.60	209.08
Third quarter	57.0000	55.0000	52.20	70.00	90.36	70.00	.....	242.86
Fourth quarter	57.0000	55.0000	52.20	70.00	90.36	70.00	.....	242.29
Per cent increase (final figure over base price)	88	96	64	152	142	119	161	341

Foreign quotations are from price section, War Industries Board. They have been reduced to quotations in terms of American money, the average rate of exchange prevailing during the period in question being used in each case.

TABLE 12.—*Comparison of foreign and domestic prices on linseed oil, turpentine, and red lead.*

Commodity	Linseed oil.			Turpentine.		Red lead.	
Country	United States.	England.	Australia.	United States.	Australia.	United States.	Sweden.
Market	New York.	Manchester.	Melbourne.	New York.	Sydney.	New York.	Christiania.
Grade	Raw.	.....	Raw B. & S.	Spirits of, Southern, in barrels.	.....	Red lead.	Red, chemically pure.
Unit	Gallon.	Gallon.	Gallon.	Gallon.	Gallon.	Pound.	Pound.
Source	Labor status, from Oil, Paint and Drug Reporter.	Chemical Trade Journal and Chemical Engineer.	Australian Hardware and Machinery.	Labor status, from New York Journal of of Commerce.	Australian Hardware and Machinery.	War Industries Board.	Farmand (Christiania).
Base (July 1, 1913, to June 30, 1914)	$0.486	$0.451	$0.75	$0.45	$0.72	$0.062	$0.055
1913:							
First quarter	.443	.468	.98	.444	.72	.065	.....
Second quarter	.448	.441	.94	.423	.73	.065	.050
Third quarter	.487	.471	.91	.401	.70	.066	.051
Fourth quarter	.470	.422	.89	.443	.71	.065	.049
1914:							
First quarter	.487	.447	.88	.483	.75	.060	.050
Second quarter	.502	.462	.91	.473	.75	.060	.050
Third quarter	.558	.531	1.07	.467	.81	.059	.055
Fourth quarter	.460	.483	.99	.471	.83	.055	.063
1915:							
First quarter	.530	.478	1.02	.449	.85	.055	.067
Second quarter	.610	.593	1.12	.465	1.02	.060	.082
Third quarter	.520	.523	1.04	.416	.86	.070	.087
Fourth quarter	.587	.570	1.08	.508	.85	.068	.097
1916:							
First quarter	.717	.832	1.30	.560	1.08	.077	.121
Second quarter	.727	.732	1.33	.466	1.09	.097	.142
Third quarter	.680	.684	1.25	.449	.89	.097	.133
Fourth quarter	.880	.853	1.32	.489	.94	.097	.133

1917:							
First quarter	.933	.960	1.48	.534	1.01	.100	.149
Second quarter	1.153	.998	1.65	.485	1.07	.113	.....
Third quarter	1.177	1.063	1.87	.423	1.21	.130	.273
Fourth quarter	1.630	1.069	2.06	.508	1.29	.103	.336
1918:							
First quarter	1.370	1.128	2.12	.469	1.38	.100	.274
Second quarter	1.570	1.159	2.20	.516	1.38	.100	.....
Third quarter	1.840	1.159	.....	.664	.....	.110	.....
Fourth quarter	1.590	1.159	.....	.724	.....	.112	.....
Percentage increase (final figure over base price)	227	157	193	61	92	81	40

Foreign quotations are from price section, War Industries Board. They have been reduced to quotations in terms of American money, the average rate of exchange prevailing during the period in question being used in each case.

TABLE 13.—*Comparison of foreign and domestic prices on brick, cement, lime, and building tile.*

Commodity	Brick.		Cement.				Lime.		Building tile.	
Country	United States.	Japan.	United States.	England.	Australia.	Denmark.	United States.	England.	United States.	Japan.
Market	New York.	Yokohama.	New York.	London.	Melbourne.	Copenhagen.	Chicago.	London.	New York.	Yokahama.
Grade	Common. No. 1.	Hard baked, second class.	Portland.	Portland best.	K. B. & S.	Danish.	Eastern common standard.	.....	Hollow, 4 by 12 by 12.	Earthen tiles.
Unit	Per M (1,000).	Per M (1,000).	Barrel.[a]	Barrel.[a]	Barrel.[a]	Barrel.[a]	Ton.	Ton.	Block.	Block.
Source	War Industries Board.	Chamber of Commerce Journal.	Private.	Tho Economist.	Australian Hardware and Machinery.	American Consul General.	War Industries Board.	World's Paper Trade Review.	Engineering News-Record.	Chamber of Commerce Journal.
Base (July 1, 1913, to June 30, 1914).	$6.33	$6.57	$1.13	$3.51	$3.51	$1.35	$4.375	$2.64	$0.06	$0.01
1913:										
First quarter	6.63	6.47	1.13	.....	3.48	1.35	4.133	2.64	.06	.011
Second quarter	6.76	6.64	1.13	.....	3.36	1.58	4.400	2.64	.06	.011
Third quarter	6.69	6.73	1.13	.....	3.48	1.58	4.500	2.64	.06	.010
Fourth quarter	6.44	6.64	1.13	3.51	3.64	1.58	4.500	2.64	.06	.010
1914:										
First quarter	6.25	6.47	1.13	3.51	3.52	1.12	4.500	2.64	.06	.010
Second quarter	5.94	6.48	1.13	3.51	3.40	1.12	4.000	2.64	.06	.010
Third quarter	5.71	6.48	1.13	3.87	4.07	1.12	3.933	2.64	.06	.010
Fourth quarter	5.49	6.48	1.13	3.55	3.93	1.12	3.566	2.64	.06	.010
1915:										
First quarter	5.60	6.48	.92	3.49	4.84	1.15	3.500	2.64	.....	.009
Second quarter	5.93	6.34	.81	3.46	5.74	1.51	3.500	2.64	.....	.009
Third quarter	5.97	6.42	1.04	3.42	5.28	1.57	3.500	2.64	.....	.009
Fourth quarter	6.27	6.42	1.15	3.41	5.49	1.66	3.500	2.64	.....	.010
1916:										
First quarter	7.86	6.72	1.22	3.44	4.90	1.82	4.033	3.70	.....	.010
Second quarter	7.71	8.39	1.22	3.43	4.84	2.70	4.466	3.48	.062	.011
Third quarter	7.48	8.60	1.22	3.99	4.71	2.77	4.800	3.36	.065	.011
Fourth quarter	7.86	9.01	1.32	4.26	4.38	2.76	5.015	3.36	.078	.013

1917:										
First quarter	9.02	9.78	1.49	4.27	4.26	2.86	5.700	3.64	.090	.015
Second quarter	9.41	10.50	1.67	4.27	4.81	3.46	5.966	4.20	.093	.016
Third quarter	8.60	10.50	1.67	4.27	5.47	4.02	6.500	4.36	.092	.017
Fourth quarter	8.55	11.88	1.67	4.28	5.83	6.12	6.500	4.68	.093	.024
1918:										
First quarter	8.50	13.04	1.69	4.28	6.16	7.97	6.500	4.68	.095	.020
Second quarter	9.64	13.63	2.13	4.27	6.39	8.21	7.500	6.00	.090	.021
Third quarter	12.51	15.66	2.15	4.27	6.65	8.29	7.500	6.00	.102	.022
Fourth quarter	12.94	20.30	2.15	4.27	.....	.....	7.500	6.00	.113	.....
Percentage increase (final figure over base price)	104	209	90	22	89	514	71	127	88	110

[a] Prices for cement sold in bulk reduced to prices per barrel.

Foreign quotations are from Price Section, War Industries Board. They have been reduced to quotations in terms of American money, the average rate of exchange prevailing during the period in question being used in each case.

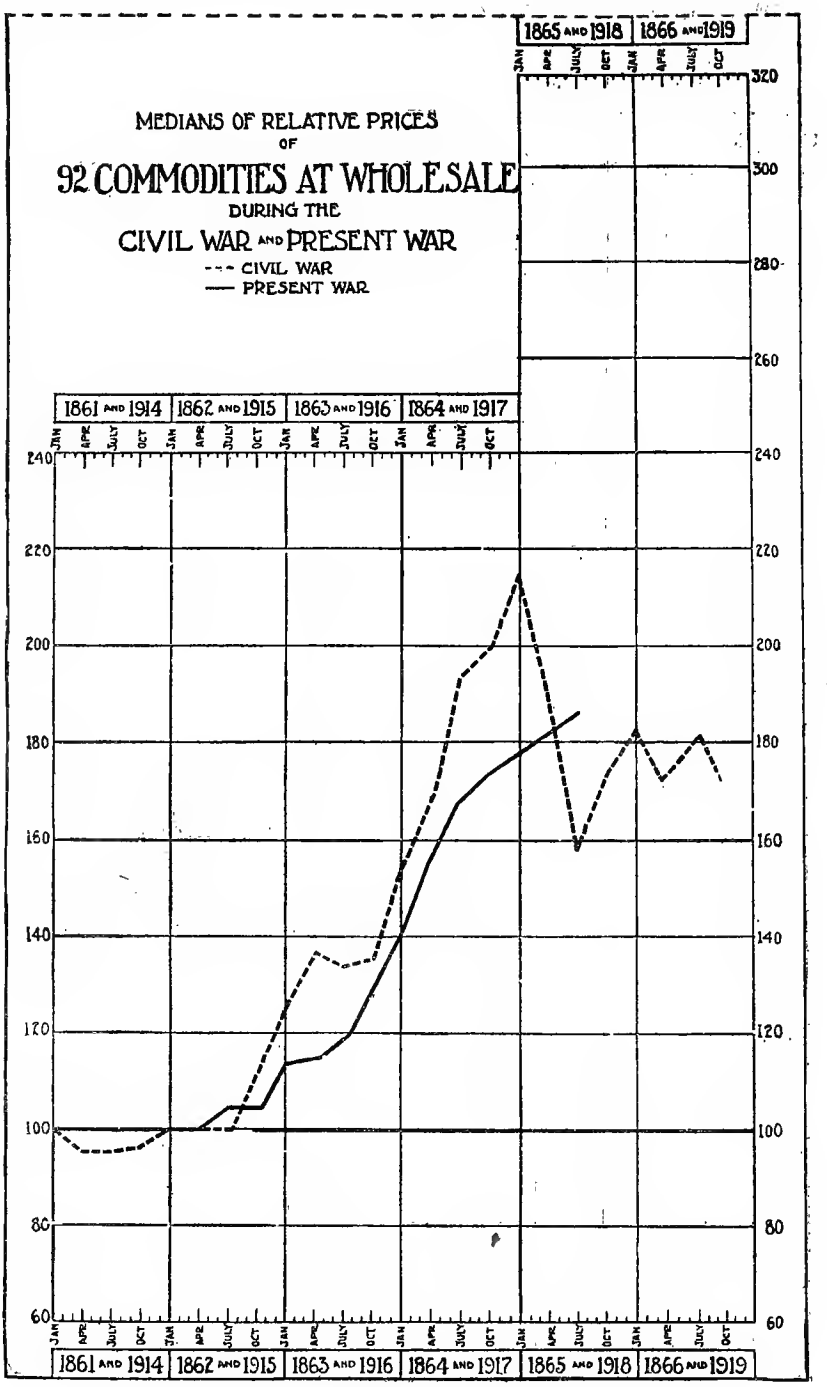


Chart furnished through courtesy of Price Section, War Industries Board.

CHART VII.

SECTION IV. CIVIL WAR PRICES AND THE CIVIL WAR RECONSTRUCTION PERIOD.

Sources of information.

The price section of the War Industries Board has made a study of Civil War prices in comparison with prices during the World War. This work has been done under the direction of Dr. Wesley C. Mitchell, who is also the author of a book entitled "Gold, Prices, and Wages under the Greenback Standard." An analysis of the War Industries Board Bulletin on Civil War prices and a further investigation of some of the statistical tables in Dr. Mitchell's book bring to light certain general facts of special interest in the year 1919.

Description of tables.

The figures in Tables 14 and 15 have been calculated for the purpose of comparison of Civil War prices with prices during the World War. The figures for the all-commodities group are the medians of relative prices of 92 commodities at wholesale, the relative prices for each commodity in the Civil War period being based on the average prices of 1860 as 100 per cent. The figures for the World War period are based on the year 1913 as the prewar standard.

The prices for the years 1860 to 1874 were taken from tables in the well-known Aldrich report.[1] Of these 92 commodities, 19 fall within the building materials group. These articles have been matched with the same number of similar articles quoted in the markets to-day, or their nearest present-day equivalents, in order to obtain comparable figures for the recent war period. Medians of relative prices were used instead of averages.

In making up the tables for the Civil War period, simple averages did not seem to give a correct indication of price relations, because the extremely high prices of some southern commodities (cotton, turpentine, tar, etc.), which were found in very small quantities in the markets, make the averages unduly high. There are no figures at hand which furnish a basis for a system of weighted averages. Consequently, medians have been chosen. The median is the figure so chosen that, as of the particular date, half of the prices of commodities of the group are above it and the other half are below it.

Fluctuations of prices of commodities in general during the two wars are shown graphically in Chart VII.

Course of prices in general during the two wars.

A comparison of the course of prices during the Civil War and the World War shows many points of similarity during the two war periods. The course of prices during the year of readjustment, 1919, and the corresponding period following the Civil War show more points of difference than of similarity.

[1] Wholesale Prices, Wages, and Transportation, report by Mr. Aldrich of the Committee on Finance; Mar. 3, 1893. Senate Report No. 1394, 42d Congress, 2d session, Part II.

During both wars the wholesale prices of commodities in general rose steadily through the war period. The rise during the Civil War period, with the year 1860 as the base, runs up to a somewhat higher level than the rise during the World War. In both wars, building materials rose in price, but they did not at either time reach levels so high as the price levels of other commodities.

In short, the course of prices during the Civil War showed the same general trend as during the World War, following the same rising spiral, viz, increase of the amount of money in circulation, increased cost of living, increased wages, and increased prices of commodities in general, each factor reacting upon the rest.

Course of commodity prices after the Civil War.

At the beginning of the year 1865, the end of the Civil War being in sight, wholesale prices broke suddenly and violently. During the first six months of the year, prices in general fell off 27 per cent from the high level of January. However, the break in wholesale prices, though unprecedented in violence and accompanied by the unsettling influence of the end of the great war, produced no business crisis or depression. Through the latter half of 1865 prices recovered from the low point until in January, 1866, they stood just 16 per cent below the level of January, 1865.

From the beginning of 1866 prices dropped slowly downward. The downward movement was quite gradual; the median for prices of 92 commodities did not reach the prewar (1860) level until the year 1878.

The cessation of hostilities did not, of itself, bring about a return of prices to prewar levels. Indeed, prices did not return to prewar levels until after other economic factors, such as the opening up of new land by railway construction, the utilization of improved agricultural implements and other labor-saving machinery, the development of foreign trade, and the organization of industries for large-scale production, had operated to reduce production costs, and, in consequence, wholesale prices.

Commodity prices compared with prices of gold.

As is well known, the period following the Civil War was a period of inflation of the currency. Owing to the policy of the Government with respect to the issue of large quantities of unredeemable paper money, gold was quoted at a premium in the money market.

Prices based on the greenback currency can not be regarded as otherwise than inflated. However, the statistics of the period show that commodity prices remained about 20 points above the price of gold through the year 1872. They remained above the price of gold up to and including the year 1877.

A comparison of fluctuation in commodity prices and gold prices is shown in Chart VIII.

The panic of 1873.

The currency situation in the Civil War reconstruction period was partly responsible for the sharp fluctuations in prices that marked the period.

Besides the money situation there were also the opportunities for development of unused land, rivers and harbors, railroads, building, all of which led to rapid expansion of business, accompanied by wild speculation.

The panic of 1873 can scarcely be looked upon as a result of the war; it did not occur until eight years after the cessation of hostilities. It was not the result of the ending of the great war, but rather the result of an expansion too rapid to be economically sound and of an unsound financial system.

Retail prices and wages.

Retail prices show a more gradual decline than wholesale prices, while wages, which had lagged behind retail prices during the war, rose rather rapidly until January, 1867, when there was a slight break and the rising trend was resumed until the panic of 1873 caused widespread unemployment. In spite of the severe nature of the panic, there was no sharp break in wholesale or retail prices or in wages at that time.

The Civil War reconstruction period as a precedent.

The similarity in the behavior of prices during the two wars is striking. It will be shown in Section V that during the first six months of the present readjustment period the decline that has taken place in prices has been slight in comparison with what took place after the Civil War, and also that it has taken place in a more orderly manner.

It was 13 years after the Civil War before prices returned to the prewar level. The principal cause of the return to the prewar level was the fact that there was such abundant opportunity for the development of new and more economical methods of production in the shape of new forms of machinery and new kinds of business organization. These opportunities do not seem to exist for this postwar period in any measure comparable with the previous period.

There seems to be no prospect of new economic factors entering into greatly lessen production costs. It should be noted on Table 15 that by January, 1871, commodity prices had reached a level 33 per cent above the prewar figure, and that they remained practically stationary at that figure through the year 1874. Although the period 1865–1871 was marked by rather sharp price fluctuations, the same result would have been reached by January, 1871, had there been a steady decline of 8 per cent per year through those six years.

Building materials prices during the two wars.

Building materials declined in price along with other commodities during the first half of the year 1865. However, the fall was less than in the case of other commodities. Whereas commodities in general dropped 27 per cent, building materials dropped only 14½ per cent. The recovery during the second half of the year was more marked, prices of building materials returning to the level of the last quarter of the year 1864, and remaining at that level for a period of a year before the decline set in.

The index figure for the building materials group remained higher than that for all commodities up to and including the year 1874. A comparison of building materials prices for the two wars is shown graphically in Chart IX.

Prices of building materials after the Civil War.

Building materials declined in price along with other commodities during the first half of the year 1865. However, the fall was less than in the case of other commodities.

The average of building materials prices for the year 1865 is 14½ per cent less than for 1864, while for all commodities the fall for the same period is 27 per cent. The recovery during the last half of the year was more marked, prices on this class of commodities returning to the level of the last quarter of the year 1864 and remaining at that level for a period of a year before the decline set in. The index figure for the building materials group remains higher than that for the all-commodities group up to and including the year 1874.

In January, 1871, prices of building materials had reached a level 41 per cent above the antebellum figure. This result would have been attained had there been a steady decline of 5½ per cent per year from the January, 1865, level. If building materials had declined from the high point of January, 1865, at a uniform rate of 4 per cent per year, until 1874, they would have reached the level of 30 per cent above the prewar figure; which is the actual level attained at that time, when building materials and commodities in general had reached the same level.

TABLE 14.—*Medians of relative prices of commodities at wholesale during the Civil War and the World War.*

	All commodities.		Building materials.	
	Civil War.	World War.	Civil War.	World War.
Number of commodities	92	92	19	19
1860 and 1913:				
January	100	100	100	100
April	100	100	100	100
July	100	100	100	100
October	100	100	100	100
1861 and 1914:				
January	100	100	100	100
April	96	100	100	100
July	96	100	100	100
October	97	100	100	100
1862 and 1915:				
January	100	100	106	100
April	100	100	112	100
July	100	102	107	100
October	111	102	116	100
1863 and 1916:				
January	125	114	133	104
April	137	115	143	109
July	134	119	139	110
October	135	130	145	117
1864 and 1917:				
January	166	142	160	124
April	169	157	177	137
July	194	169	189	152
October	200	174	200	152
1865 and 1918:				
January	216	178	200	161
April	190	182	196	172
July	158	187	171	181
October	175	196	200	186
1866 and 1919:				
January	182	[a] 187	200	[a] 186
April	173	[a] 190	200	[a] 186
July	181	.....	200	.....
October	173	.....	199	.....

[a] Estimated. Series discontinued after December, 1918.

Figures from Bulletin of the War Industries Board.
Relative prices for Civil War based on average for 1860=100 per cent.
Relative prices for World War based on average for 1913=100 per cent.

TABLE 15.—*Medians of relative prices of commodities at wholesale in the period following the Civil War.*

	All commodities (92).	Building materials (19).		All commodities (92).	Building materials. (19).
1867:			1871:		
January	169	175	January	133	141
April	166	175	April	131	142
July	150	158	July	130	143
October	162	158	October	129	144
1868:			1872:		
January	158	150	January	133	150
April	162	165	April	140	150
July	154	175	July	130	145
October	159	152	October	133	150
1869:			1873:		
January	159	152	January	135	150
April	159	151	April	137	150
July	158	150	July	130	152
October	153	156	October	131	150
1870:			1874:		
January	147	149	January	130	146
April	140	146	April	120	146
July	132	144	July	130	142
October	135	142	October	130	135

Compiled by T. S. Holden, from "Gold, Prices, and Wages under the Greenback Standard," by W. C. Mitchell.

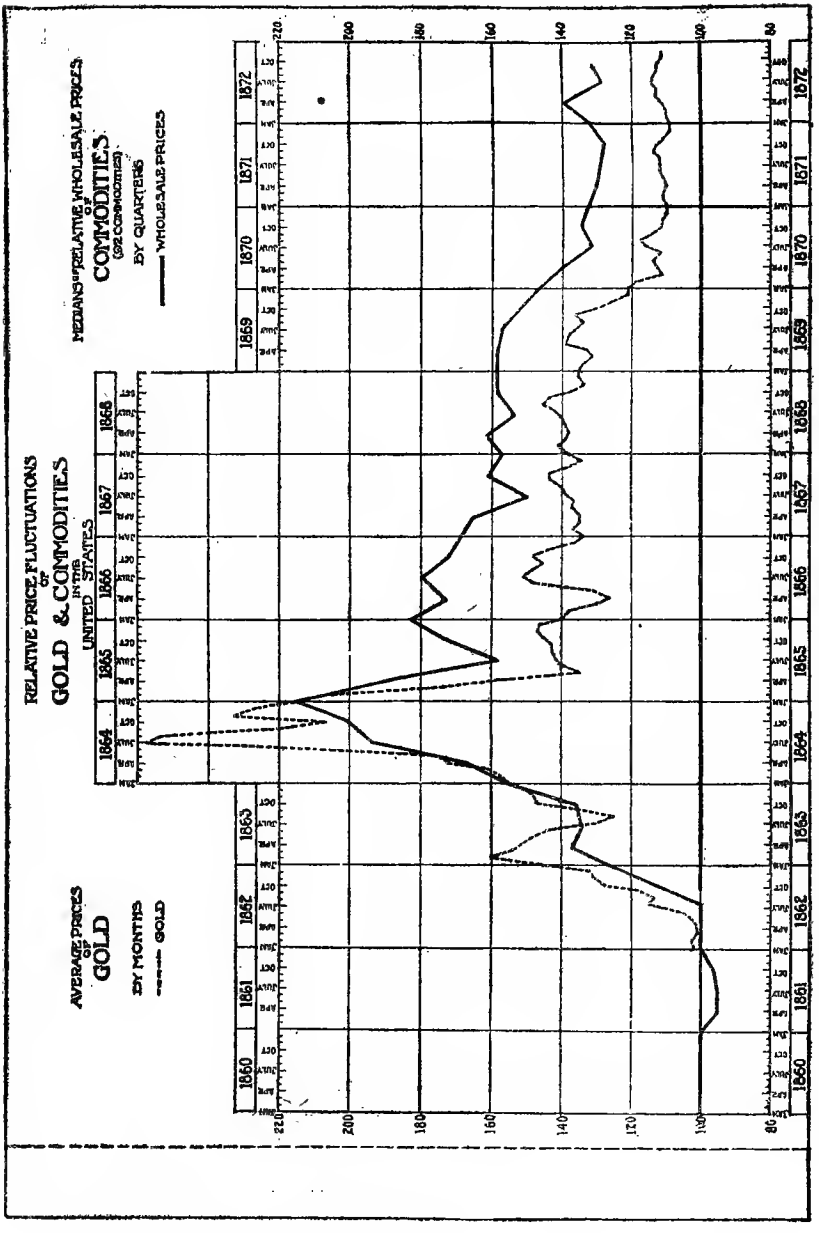


Chart furnished through courtesy of Price Section, War Industries Board.

CHART VIII.

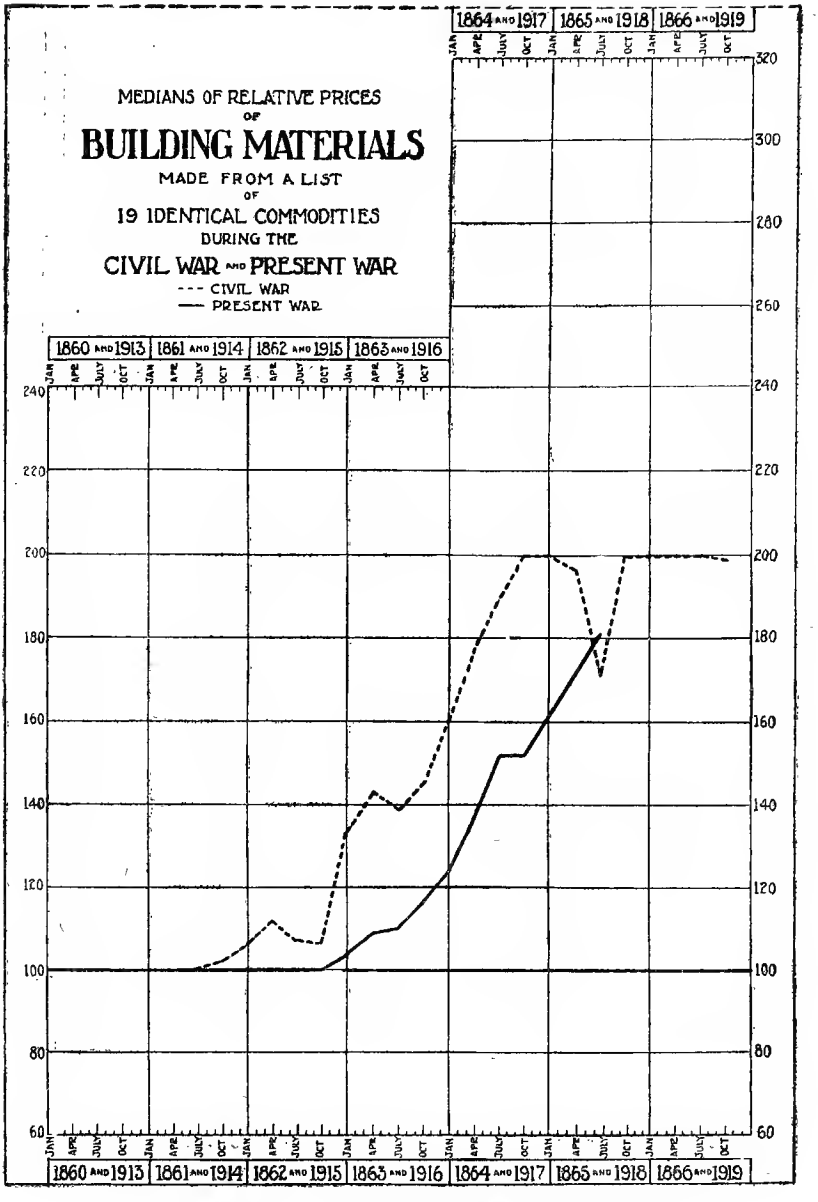


Chart furnished through courtesy of Price Section, War Industries Board.

CHART IX.

SECTION V. COURSE OF COMMODITY PRICES DURING THE SIX MONTHS FOLLOWING THE ARMISTICE.

Basis of the study of the readjustment period.

A study has been made of the course of commodity prices during the six months following the armistice, the study being based on the quotations of wholesale prices of 313 commodities which are published weekly in Dun's Review. Dun's index number stood at its highest level on October 1, 1918. Since this number is based on prices for the previous month, it is thus in agreement with the Bureau of Labor Statistics figure which shows the high level for the month of September.

For the purpose of comparison in Table 16 the index figures of the London Economist have been placed in a column parallel to the figures from Dun's, and both sets of figures are given in separate columns reduced to the 1913 base. Since these figures on the 1913 base have been computed on a slightly different system from those shown in connection with Section III they are not comparable with those figures.

The decline in the price level in the United States.

Dun's index number stood at its highest level on October 1, 1918. From October 1, 1918, to March 1, 1919, the price level declined; after March 1 it took an upward turn. In order to make evident the orderly nature of the price adjustment, it is considered worth while to present some figures on the nature and number of commodities advancing and declining from week to week.

At first weekly quotations showed more advances than declines, although the price level fell by a small amount. From November 30, 1918, until March 22, 1919, there were each week more declines than advances. February 1 showed 59 declines and 9 advances, this being the smallest number of advances noted during that period and at the same time the largest number of declines. The month of January showed the greatest decline in the price level of any month, about 4½ per cent. The excess in number of commodities showing declines over the commodities showing advances has steadily decreased since February 1, until on March 22, the report shows 26 advances and 26 declines. March 29 figures show 20 advances and 54 declines. Of these 54 commodities showing declines 21 were on steel products, the declines announced being the result of action of the steel committee in conference with the Industrial Board of the Department of Commerce. Previous declines in steel at the beginning of the year had not brought the prices of these products low enough to stimulate business, as they were still considerably above the general price level of other commodities. Through the month of April and the first two weeks of May there were more advances than declines each week.

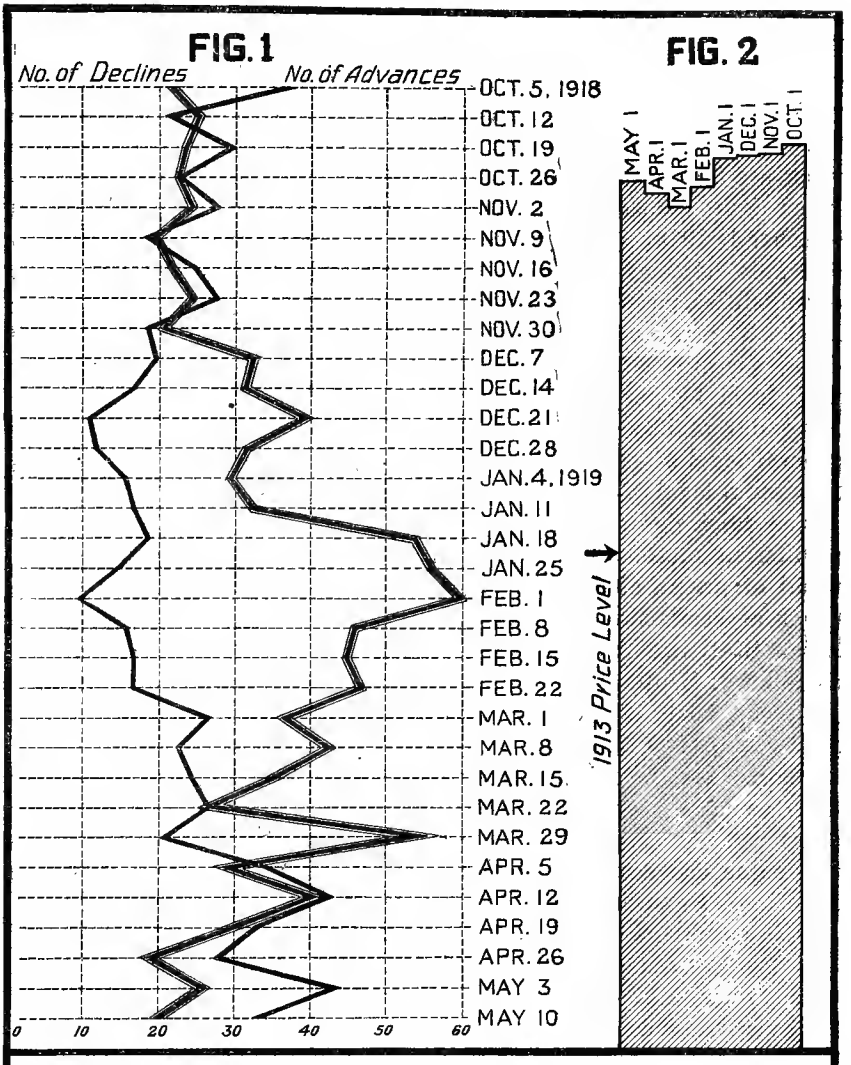
Thus, it is seen that through the period from October 1, 1918, to May 1, 1919, commodity prices went through a more or less orderly process of readjustment. Although there were many declining prices, at the same time there were others advancing. Of greater importance than the number of advances and declines from week to week are fluctuations of the index figure. On March 1, 1919, Dun's index figure showed a decline of 6.9 per cent from the high point of October 1, 1918. During the month of March, in spite of the considerable declines in steel, there were sufficient advances in other commodities, mainly foodstuffs, to cause a slight advance in the price level. The index for April 1 shows the price level only 5.7 per cent below the high point of October 1. The index for May 1 shows the price level 4.7 per cent below that of October 1, the continued rise being due mainly to further advances in foodstuffs. By July 1 the general level of prices had passed by a slight margin the previous maximum level of October 1, 1918.

The index figures of the Bureau of Labor Statistics, computed by a different method from those of Dun's, indicate the same general trend of prices, although the percentages of reductions are not in exact agreement with those indicated by Dun's. The Bureau of Labor Statistics indices (base, average for the year 1913, 100) are as follows: September, 1918 (maximum), 207; January, 1919, 203; February, 1919, 197; March, 1919, 201; April, 1919, 203; May, 1919, 207; June, 1919, 207.

Figures for the numbers of commodities declining and advancing from week to week are shown in Table 17, and are also indicated graphically on Chart X. In figure 1 of the chart the abscissæ of the single-line curve represent the numbers of advancing prices noted from week to week, while the abscissæ of the triple-line curve represent the numbers of declining prices from week to week. Figure 2 indicates the change in Dun's index number for all commodities from month to month. The small arrow half-way up on figure 2 indicates the average index for the year 1913.

Decline of the price level in England.

Table 16 shows the London Economist index figures from September 1, 1918, to March 1, 1919. The September 1 figure was the highest price level recorded in England. The reduction in the price level during the period September 1, 1918, to March 1, 1919, was 7.5 per cent. This figure is remarkably close to the percentage of reduction in the United States, although the general advance in England over prewar prices has been somewhat higher than in this country.



THE FALL OF THE PRICE LEVEL DURING THE PERIOD OF READJUSTMENT

FIG. 1 - *Number of Declines and Advances in Weekly Quotations*
FIG. 2 - *Dun's Index Number for 313 Commodities*

U.S. DEPARTMENT OF LABOR
INFORMATION AND EDUCATION SERVICE
DIVISION OF PUBLIC WORKS AND CONSTRUCTION DEVELOPMENT

CHART X

Comparison of March, 1919, prices with March, 1918, prices.

Of 313 commodities quoted in Dun's Review of March 8, 1919, 140 were quoted at prices lower than they were a year previous, and 126 were quoted higher than they were the year previous. The index figures indicate a reduction in the price level from March 1, 1918, to March 1, 1919, of 4.8 per cent. The commodities which were quoted at prices lower than the prices of the previous year consisted of certain foodstuffs, drugs and chemicals, wool, woolen and cotton textiles, metals, and oils. With the exception of steel products, no building materials were quoted at prices lower than in March, 1918. Of the commodities which were higher in price than they were at the same time in 1918, the principal ones were certain foodstuffs, lumber and other building materials, drugs and chemicals, hides, naval stores, oils, paints, and tobacco.

According to the figures of the London Economist the British price level was only 0.5 per cent lower on March 1, 1919, than on March 1, 1918.

Exceptional commodities.

An examination of the price records of the Bureau of Labor Statistics shows only two commodities, in the list of nearly 300, that were lower in price in 1918 than they were in 1913. These two commodities are onions and coffee (Rio No. 7). Both of these commodities increased in prices after the armistice and have been quoted about 50 per cent above the prewar price.

Of the commodities that have been included in the study of the price level, the most marked declines since the armistice occurred in the case of lake copper and pig lead. In November, copper was 69 per cent above the prewar price. After that time, it dropped practically to the prewar level. Pig lead in November was 79 per cent above the prewar price, and on April 12 it was only 11 per cent above it.

The exceptional behavior of these prices is to be explained by exceptional circumstances. The average production of copper in the United States in the years 1912 to 1916 was 1,722,000,000 pounds; the average consumption was 932,000,000 pounds; the remainder of the product being exported to foreign countries. The 1918 production of copper in the United States was 2,450,000,000 pounds. The cessation of the war left the copper interests in a serious situation. Figures of the United States Bureau of Mines indicate that on January 1, 1919, stocks of copper in this country in excess of normal aggregated some 600,000,000 pounds.

In spite of price reductions, little export demand developed during the first half of 1919, nor was there any considerable domestic demand. The drastic reductions did not stimulate business, and it has been stated that the low prices quoted were under the cost of pro-

duction. One feature of the copper situation is the fact that copper can be used over again more readily than any other metal, and consequently copper already worked into war materials can be used again. This is not true to any considerable extent in the case of iron and steel; hence the markets have not been overstocked in this commodity to the extent that they were in the case of copper.

The copper industry seems to have been more seriously disturbed during the period of readjustment than most others. The United States Government did not make an early disposition of its holdings of copper. It agreed to dispose of them through the dealers so that the placing of its stocks on the market would not tend to further disturb the market situation.

The case of lead is somewhat different from that of copper. This was not in such great demand during the war as the other metals, and was not controlled by the Government as the other metals were; however, at the beginning of the year, there were large stocks of pig lead on hand. At the time of the signing of the armistice the Government was purchasing about 25,000 pounds monthly. This demand was eliminated from the situation with the cessation of war activities.

The American Smelting & Refining Co. controls about half the product of this country, and it practically fixes the market prices. It would appear that this company reduced the price in order to stimulate business. It also appears that the desired result was not speedily attained, as no business developed for some time after the reductions were announced. One of the independent mining companies which produces about 5 per cent of the total output in this country shut down its mines early in 1919, stating that it could not afford to produce at the prices then current. It is to be noted that after that time the price of lead reacted upward.

Reductions in steel, March 20, 1919.

In Section II it was shown that the reductions in steel brought the average for finished steel products down to a figure 95 per cent above the prewar level. Since this average was obtained by a system of weighting similar to that used by the Bureau of Labor Statistics, it is comparable with the figures of that bureau. The bureau index number for wholesale prices of all commodities for the month of February, 1919, was 197 and for March, 1919, 200. It is thus seen that the action of the conference on steel prices had the effect of bringing these products down very close to the general level of all commodities.

The new price level.

Examination of actual figures shows that the price level has declined only a very little, and for the most part the declines have taken place in a gradual, orderly manner.

In general, the course of prices since the armistice seems to bear out the theory that a new price level has been established.

TABLE 16.—*Course of commodity prices during the 1919 readjustment period.*

[Base: Average of figures for the year 1913.]

Period	United States.		Great Britain.	
	Dun's index figure.	Reduced to 1913 base.	London Economist index.	Reduced to 1913 base.
Sept. 1, 1918			a 6,267	231
Oct. 1, 1918	a 233.227	193	6,238	231
Nov. 1, 1918	230.529	191	6,210	230
Dec. 1, 1918	230.375	191	6,212	230
Jan. 1, 1919	230.146	190	6,094	225
Feb. 1, 1919	220.050	183	5,851	216
Mar. 1, 1919	217.037	179	5,796	214
Apr. 1, 1919	219.973	182	5,723	211
May 1, 1919	222.193	184	5,774	213
June 1, 1919	227,973	188	5,988	221
July 1, 1919	233,707	194	...	...
Mar. 1, 1918	227.977	188	5,828	215.5
	Per cent.		*Per cent.*	
Fall, Mar. 1, 1918, to Mar. 1, 1919	4.8		0.5	
Fall, Sept. 1, 1918, to Mar. 1, 1919	...		7.5	
Fall, Oct. 1, 1918, to Apr. 1, 1919	5.7		...	
Fall, Oct. 1, 1918, to May 1, 1919	4.7		...	

a Highest figure reached.

TABLE 17.—*Number of declines and advances in weekly quotations during the period of readjustment.*

	Number of advances.	Number of declines.	Number of advances over declines.	Number of declines over advances.
1918.				
Oct. 5	37	21	16	...
Oct. 12	21	25	...	4
Oct. 19	29	23	6	...
Oct. 26	22	22	...	...
Nov. 2	27	24	3	...
Nov. 9	18	19	...	1
Nov. 16	24	21	3	...
Nov. 23	27	24	3	...
Nov. 30	18	20	...	2
Dec. 7	23	32	...	9
Dec. 14	16	31	...	15
Dec. 21	10	39	...	29
Dec. 28	11	31	...	20
1919.				
Jan. 4	15	29	...	14
Jan. 11	16	32	...	16
Jan. 18	18	53	...	35
Jan. 25	14	55	...	41
Feb. 1	9	59	...	50
Feb. 8	15	45	...	30
Feb. 15	16	44	...	28
Feb. 22	16	46	...	30
Mar. 1	26	36	...	10
Mar. 8	22	42	...	20
Mar. 15	24	35	...	11
Mar. 22	25	26	...	...
Mar. 29	20	54	...	34
Apr. 5	34	29	5	...
Apr. 12	42	40	2	...
Apr. 19	32	29	3	...
Apr. 26	28	19	9	...
May 3	43	26	17	...
May 10	33	20	13	...
May 17	53	25	33	...
May 24	73	17	56	...
May 31	40	2	38	...
June 7	58	24	34	...
June 14	38	31	7	...
June 21	41	15	26	...
June 28	41	19	22	...

SECTION VI. INCREASE IN CONSTRUCTION COSTS.

Introduction.

Data sufficient to estimate the average increase of construction costs all over the country would be an extremely valuable addition to this report. In the brief time permitted for this investigation it has not been possible to secure sufficient data to be representative of all types of construction in all parts of the country. However, figures have been secured for various types of buildings located in various parts of the country. These figures are believed to be fairly representative of the present cost situation as compared with that of previous years.

Comparative costs of typical wood-frame dwellings, 1915 and 1919.

The experts of the United States Housing Corporation were asked to furnish an estimate on a typical wood-frame building. They prepared an estimate on a 12-room 2-family wood-frame-and-stucco house, based on material and labor costs prevailing in the neighborhood of New York during the first quarter of 1919. A comparative estimate of the cost of the same house in the year of 1915 was made in the office of the Division of Public Works and Construction Development. These figures show an increase of 48.4 per cent in the cost of construction of this building. An itemized summary of this comparative estimate is given in Table 18.

Comparative construction costs, 1911–1918, of reinforced-concrete hospital buildings.

An architect in St. Paul, Minn., has furnished figures on the cost per cubic foot of a number of buildings actually constructed in different years. One was a hotel and the rest hospital buildings, but all were of substantially the same construction. The type of construction was reinforced concrete. All were designed by the same architect and built by the same contractor. The figures are given below:

Cost of reinforced-concrete buildings in St. Paul, Minn..

Year.	Cost per cubic foot.	Relative cost.	Year.	Cost per cubic foot.	Relative cost.
		Per cent.			*Per cent.*
1911	$0.21	81	1916	$0.30	120
1912	.22	88	1917	.39	156
1914	.24	96	1918	.45	180
1915	.25	100			

These figures show that the 1918 building cost 80 per cent more than the 1915 building. The 1918 building could probably be duplicated for a somewhat lower figure in April, 1919, owing to reductions in prices of some materials and probable increased efficiency of labor.

Comparative costs of typical steel-frame office buildings, 1915 and 1919.

On February 20, 1919, the Engineering News-Record published an estimate of the increase of the cost of construction of a typical steel-frame office building in the city of Chicago as between February, 1919, and the year 1915. The comparative estimate was based on an actual building erected in 1915, the 1919 figures being estimated. Since these figures appear to be substantially correct, the comparative estimate is given in Table 19.

This estimate indicates an increase of 87 per cent on this type of building. Since these figures were published, reductions in some of the materials have taken place, and the increase over 1915 for the month of April, 1919, would probably be just a little more than 80 per cent.

Other figures on construction costs.

Other figures on increase of costs of buildings have been furnished by various New York architects and contractors. Some of these figures are based on actual building construction and some on contractors' estimates. These figures are shown in Table 20.

Average increase of cost of construction.

On the basis of the figures at hand, and taking into consideration the relative importance of each type of construction represented with reference to the whole volume of building construction, indices representing average construction costs have been computed on the basis of the figures at hand. In these computations the relative importance of each type of construction represented with reference to the total volume of building construction has been considered. These figures are assumed to be only approximately correct. They are given below:

Year.	Index.	Year.	Index.
1914	100	1917	139
1915	100	1918	159
1916	117	1919 [a]	162

[a] First four months.

Figures on the cost of road construction.

Some comparative figures on costs of road construction have been obtained from the Bureau of Public Roads. The prices given under the caption of 1914 were obtained from annual reports of the various highway departments, and the prices under the caption of 1918 are the average on the prices used in the estimates for the various Federal

aid projects submitted by the respective States. The comparative figures are given below:

		1914	1918	Increase.
MASSACHUSETTS.				
Excavation:				*Per cent.*
Earth	cu. yd.	$0.50	$0.92	84
Rock	do	2.00	4.50	125
Concrete structures	do	11.00	16.00	45.5
		13.50	21.42	58.6
OREGON.				
Excavation:				
Earth	cu. yd.	.28	.55	96.5
Rock	do	.77	1.50	95.0
Concrete structures	do	15.00	25.00	66.6
		16.05	27.05	68.5
WISCONSIN.				
Excavation, earth	cu. yd.	.58	.70	20.7
Concrete structures	do	11.29	16.00	42.0
Water-bound macadam	do	2.13	4.20	97.5
Gravel surfacing	do	1.45	1.50	3.5
		15.45	22.40	45.0
ALABAMA.				
Excavation, earth	cu. yd.	.25	.35	40.0
Concrete structures	do	9.00	16.50	83.4
Sand clay	do	.30	.50	66.6
		9.55	17.35	81.6
NEW YORK.				
Excavation:				
Earth	cu. yd.	.50	.80	60.0
Rock	do	1.25	1.50	20.0
Concrete structures	do	7.00	8.50	21.2
Water-bound macadam	do	3.50	5.25	50.0
		12.25	16.05	31.0

The average of these increases is 57 per cent. The figures indicate a rather wide discrepancy as between the different localities. The average is given as an approximate indication of the general increase in cost of this type of construction.

On April 11, 1919, the Railroad Administration announced a reduction of 10 cents per ton in the freight rates on sand, gravel, and crushed stone when consigned to States, counties, and municipalities. The order provided for a minimum of 40 cents per net ton, except in cases where the regular commercial rates were lower than that amount, in which instance the regular rates still held. As a consequence of this reduction, the cost of public roads would be reduced somewhat from the figures given above.

TABLE 18.—*Summary of estimate on twelve-room two-family house prices, New York market, 1915–1919.*

	1915	1919	Ratio.
Excavation	199.23	293.97	1.48
Masonry	573.37	847.09	1.48
Interior plaster	365.80	549.47	1.50
Exterior plaster	284.77	458.05	1.60
Rough carpentry	1,199.50	1,704.54	1.42
Finished flooring	170.67	224.18	1.31
Screens	37.90	48.00	1.27
Millwork (exterior)	241.25	386.08	1.60
Millwork (interior)	331.96	544.50	1.64
Roofing	120.57	198.96	1.65
Painting	138.88	243.05	1.75
Plumbing	311.84	410.00	1.35
Hot-air heating	373.94	528.00	1.41
Electric work	80.45	118.00	1.47
Finish hardware	45.70	80.00	1.75
Rough hardware	42.80	75.00	1.75
Total	4,518.63	6,708.89	
Per cent of increase 1919 over 1915			48.4

	1915		1919	
	Amount.	Per cent of total.	Amount.	Per cent of total.
Labor	$1,980.27	43	$2,710.68	41
Materials	2,538.36	57	3,998.21	59
Total	4,518.63	100	6,708.89	100

TABLE 19.—*Summary of estimate on steel-frame office building.*[a]

[Prices: Chicago market, 1915–1919 (February)]

	Actual 1915 costs.	Ratio.	Estimated 1919 costs.
Masonry	$175,400	1.52	$266,608
Steel, material	100,700	3.15	317,205
Steel, erection	20,100	1.29	25,929
Foundations	81,100	1.54	124,894
Elevators	74,000	2.00	148,000
Carpentry	73,800	1.86	137,268
Ornamental iron work	62,600	2.20	137,720
Heating and ventilating	62,100	1.92	119,232
Fireproofing	47,000	1.70	79,900
Engines and generators	41,000	2.00	82,000
Plumbing, drainage	30,800	1.54	47,432
Electric wiring	29,500	2.00	59,000
Terra cotta	26,500	1.70	45,050
Various minor items, e. g., glazing, hardware, roofing, painting, lighting, etc	129,200	1.50	193,800
Architects' and engineers' fees	46,200		89,201
Total	1,000,000	1.87	1,873,239

[a] From the Engineering News Record.

TABLE 20.—*Comparative costs of various types of buildings.*

[Figures from various architects and contractors.]

NONFIREPROOF BUILDINGS.

Kind of building	Location.	Type of construction.	Dates of comparison.	Increase in cost.
				Per cent.
Store	Bethlehem, Pa	Lumber and brick	1909–1919	96
Residences	Baltimore, Md	Stone, brick, lumber	1915–1919	64
Do	Staten Island, N. Y	Lumber and plaster	1915–1919	48
Do	Philadelphia, Pa	Stone and lumber	1917–1919	18
Do	do	Brick and lumber	1917–1919	50
Do	do	Stone, brick, lumber	1917–1919	35
Do	New York City (alterations)	Brick and lumber	1917–1919	39
Do	Monclair, N. J	Stone, concrete, lumber	1918–1919	18
Do	Minneapolis, Minn	Brick, stone, lumber	1918–1919	20
Do	Wilmington, Del	Lumber and plaster	1918–1919	25

FIREPROOF BUILDINGS.

Factories	Brooklyn, N. Y	Reinforced concrete, brick outer walls, sawtooth roof.	1915–1919	60
Do	Newark, N. J	do	1915–1919	52
Do	Long Island City, N. Y	do	1918–1919	13½
Do	New York City	do	1918–1919	32
Hospital	St. Paul, Minn	Reinforced concrete	1915–1919	80
Office building	Chicago, Ill	Steel frame	1915–1919	87

VII. LUMBER.

Importance of the lumber industry.

The size and importance of the lumber industry and its relation to building makes the study of the conditions surrounding the production and marketing of this product of prime importance in any survey of prices of building materials. The somewhat limited scope of the present study makes it possible to present here only a limited survey of the industry as affected by the war.

Lumbering comes next to agriculture in importance among the basic industries of the United States. It ranks third among manufactures in the value of its products, according to the census of 1909, dropping behind the meat-packing and metal industries only. It employs approximately 10 per cent of all the wage earners in manufacturing industries. The annual sales of this product aggregate one and one-half billion dollars per year and the industry has a combined investment of approximately two and one-half billions.

The amount of lumber entering, as raw material, into different forms of construction work differs widely. In the average frame house this item forms a predominant part, and in factory building or apartment construction it becomes a factor in building cost, as it is used for scaffolding, forms for concrete work, interior trim, special finish, wood block flooring, and in many auxiliary ways. In spite of the great development of various forms of fireproof construction

within the past few years, lumber remains by far the most important group of building materials in the extent of its use and the value of the product.

Stands of softwoods, by regions and species.

For the purpose of studying the relationship between the lumber industry and building, we may consider chiefly the use of softwoods, as these comprise 90 per cent of the lumber used in construction work.

The principal softwoods and their regional distribution have been estimated as follows:

Table of standing timber.[a]

Region.	Species.	Feet in billions.	Total.
Pacific Northwest	Douglas fir	688.47	
	Western pine	92.18	
	Spruce	12.61	
	Cedar	61.00	
	Miscellaneous	148.26	
			1,002.52
Southern States	Shortleaf pine	152.11	
	Longleaf pine	160.52	
	Cypress	23.05	
	Hemlock	6.02	
	Red cedar	1.60	
	White pine	1.60	
	Spruce	2.40	
	Miscellaneous	.62	
			347.92
California	Douglas fir	36.60	
	Western pine	121.65	
	Redwood	73.90	
	Hemlock	.13	
	Miscellaneous	66.96	
			298.24
Inland Empire	Douglas fir	34.33	
	Western pine	32.58	
	Miscellaneous	114.52	
			181.43
Lake States	Hemlock	22.30	
	White pine	16.03	
	Spruce	4.46	
	Miscellaneous	8.68	
			51.47
Northeastern States	White pine	10.63	
	Spruce	15.64	
	Hemlock	2.60	
	Norway pine	.50	
	Miscellaneous	3.00	
			32.37
All others	Douglas fir	2.60	
	Hemlock	5.77	
	Hardwood	39.15	
			47.52
Total stand			1,961.47

[a] From Forest Service, U. S. Department of Agriculture.

The stand of timber by species is as follows:

	Feet in billions.		Feet in billions.
Douglas fir	762.00	Hemlock	36.82
Miscellaneous wood	341.04	Spruce	35.11
Yellow pine	312.63	White Pine	28.26
Western pine	246.41	Cypress	23.05
Redwood	73.90	Norway Pine	.50
Cedar	62.60		
Hardwood	39.15	Total stand	1,961.47

Douglas fir is the species having the greatest stand, approximately three-quarters of a trillion feet. This is measured according to existing standards of cutting, which does not include a complete utilization of all waste products.

The miscellaneous group undoubtedly includes many species that might be included under the other headings; but they are located in patches so separated from any large holdings and in such small stands that no attempt could be made to show definite segregation of the various species.

Southern yellow pine has a stand of somewhat over 300 billion feet. At the present rate of cutting and regrowth it is estimated that this stand will not be exhausted for 20 years to come. The gradual diminution in size of holdings, preventing large-scale operations, however, causes the actual cutting to become less economical. Consequently, it is extremely doubtful whether yellow pine can be cut for so long a time under existing conditions with a profit to the producer.

At present the Southern pine industry has approximately 19,000 mills producing about 18 billion feet annually. Many of these mills are small portable mills put in by the farmers or by small operators to assist in clearing the land for agricultural purposes. The lumber product is of secondary importance, as there is necessarily a large waste. Contrasted with this large number of mills are the nine hundred and odd mills of the Pacific Northwest, producing annually about 5 billion feet. In other words, the Pacific Northwest has one-eighteenth the number of mills of the Southern Pine region and it produces one-third the amount of lumber the Southern pine region produces.

It would appear, therefore, from the study of the distribution of standing timber that the country must gradually turn to the Northwest, just as in the past it has turned from the Northeast to the Lake States and from the Lake States to the South. As an illustration of the shifting of the main source of lumber supply, it may be interesting to note that in 1850 the New England States produced 54 per cent of our total supply of lumber. In 1914 they produced 9 per cent. In 1870 the Pacific States produced 3.1 per cent; in 1914 they produced 19.3 per cent; and to-day approximately 25 per cent. In 1860 the Southern States produced 16.5 per cent. To-day they produce 47.9 per cent. This shifting of the source of supply has involved various problems of increasing cost of transportation, utilization of cut-over lands, aridity, and waste.

Annual production of lumber.

The amounts of lumber cut in the United States for certain years, as computed by the Forest Service of the United States Department of Agriculture, are given in the following table:

Production of lumber in the United States.

Calendar year.	Millions of feet.	Calendar year.	Millions of feet.
1890	23,494.9	1915	37,011.7
1900	34,780.5	1916	39,807.2
1908	42,000.0	1917	36,000.0
1913	38,387.0	1918	a 32,400.0
1914	37,346.0		

a Estimated.

The maximum production of lumber was reached in the year 1908. The gradual increase in production up to that year had been encouraged by the promise of fairly high profits that was held out by the prices that prevailed from 1895 to 1908. In 1908 conditions of overproduction began to be apparent and competition between the West and the South for the markets of the Middle West had the effect of lowering prices. The consequent lessening of profits tended to decrease production.

After 1908 production decreased somewhat each year, with the exception of the year 1916, when it showed a fair increase over the years immediately preceding. The slump in the years 1917 and 1918, however, was marked. The decrease after 1908 may be partially accounted for through readily available timber becoming less and less accessible. It became increasingly necessary to build roads and to extend railroad facilities to bring the raw material to the mills.

The capacity production of the country has been variously estimated at 65 to 75 billion feet per annum. If these figures be accurate, the output has never approached the full capacity of the mills.

From the production table it is seen that the timber cut in 1917 was 10 per cent less than the output of 1916, and that a further reduction of 10 per cent in output was experienced in 1918. The 1918 production figure, as estimated, is 14 per cent under the average for the preceding five years. The 1918 production is seen to have been about half the total capacity of the industry.

In a statement made before the Industrial Board of the Department of Commerce on March 22, 1918, Mr. John H. Kirby, president of the National Lumber Manufacturers' Association, stated that the wartime prices fixed by the Government on lumber were such as to stimulate only a small proportion of the productive capacity of the industry.

Mr. Kirby further stated that the existing capacity of the sawmills in the United States was, at the beginning of the war, far in excess of the quantity considered necessary for the efficient maintenance of the nation's war program; that, on account of the restriction of general building activities, the normal markets and normal channels of trade of the industry were in large measure closed to it; and that, had the

war long continued, the inevitable result would have been general discontinuance of operations and widespread idleness of mills. The general reduced demand existed in spite of heavy demands for special kinds and sizes of timber for the Government's war needs. In the construction of cantonments in the South enormous quantities of yellow pine were used. There was also a great demand for shipbuilding timbers. The latter demand, it has been stated, resulted in a slight surplus in the production of fir. A demand for spruce was accentuated by the use of this wood in airplane construction. The demands were for special sizes and grades and much waste resulted in securing the proper logs. This waste or by-product was of small utility and was left in the forests or mill yards, or sold locally, having little or no effect upon general market conditions.

The call of labor to service in the Army and to other industries undoubtedly crippled lumber production to a very considerable extent in those regions where there was a great demand for the product. In the Southern pine region the labor shortage continued well into the first half of 1919. It is also likely that, influenced by the labor shortage, lowered efficiency of labor contributed to the decrease of the lumber output.

Apparently there were surplus stocks of lumber in 1915 and 1916. These surplus stocks were largely used up in 1917 and 1918. Questionnaires sent to the retail trade throughout the country in February, 1919, revealed the fact that stocks at that time were, for the most part, low. Most of the smaller yards of the country were fairly depleted. The stocks that were normal were those of the larger cities. Out of the 65 yards reporting from the State of Ohio, only 9 reported stocks above normal. Of 40 yards reporting from Connecticut, only 7 reported stocks above normal. Over 50 per cent in each of these States reported less than the usual supply on hand. In many other States the percentage ran about 50 per cent of normal.

Prewar operating conditions.

As an industry, lumbering is different from any other basic industry. The very abundance of standing timber in the hands of private owners has been considered by some as being in itself a weakness. There are some economists who urge that the undeveloped timberland should be held by the Government and the right to cut timber be sold as the needs of the country and condition of the market warrant.

The amount of working capital behind the timber holdings has a marked influence in the rapidity with which the timber is marketed or the policy behind its retention. A good comparison is offered in the States of Washington and Oregon. The former is a State of concentrated holdings, whereas Oregon is one of decentralized ownership. In Washington the timber is being converted three times more

rapidly than in Oregon. There are many reasons for this; among them, accessibility of shipping facilities, lack of capital on the part of small owners to exploit their holdings, and laws that prevent the pooling of interests for the purpose of exploitation.

Assistant Forester William B. Greeley has pointed out in his report on "Economic aspects of the lumber industry" that competition in this industry is of two kinds—(1) within the producing region, and (2) between different regions in selling their product in markets within common reach. In recent years there has also developed considerable competition with various substitute materials.

The problem of transportation has been a difficult matter in the lumber industry, because of the constant recession of sources of supply from the manufacturing centers and the ultimate consumer. In the early days of the industry the mills were built at the sources of supply and along the waterways, such as the Penobscot, the Hudson, and the Delaware Rivers. The Great Lakes were utilized in the development of the North Central regions, and the waterways of the South, and the Gulf ports have been of great service in the development of that region.

Gradually the supply receded further from the waterways, making the construction of roads and railroads necessary. This added to the cost of production. The development of rail facilities led to the concentration of manufacturing and increase in the size of the mills. Freight rates increased and gradually came to absorb one-fifth to one-fourth the retail price. This condition played a large part in the development of competitive markets. The Middle West became a hot-bed of competition for northern, southern, and western woods, while the markets of the east coast suffered from actual shortages at times, and rates higher than the average. The opening of the Panama Canal has served to equalize this condition and give the western woods a chance to enter into the eastern markets.

The practice of shipping "transit" cars to central markets in advance of any purchase has tended somewhat to demoralize the markets. This condition has been in evidence since 1908.

Close economy and exact business methods were unknown in the earlier days of the industry, when liberal profits could be counted upon to make up the deficiencies caused by inefficient methods. In many cases increases in stumpage costs were capitalized; whereas, in accordance with safe accounting methods, the carrying expenses should have been provided for by charges against profits. The profits, however, were meager in many cases, and the tendency was to capitalize this burden in the hope of meeting the increased cost of stumpage in more favorable years.

The memory of large profits made in the earlier days of the industry brought about an undesirable speculation in stumpage, particularly

in the Northwest. This led to overcapitalization and the consequent burden of high interest charges and high taxes. In the West, particularly, large amounts have been borrowed on the timber, adding further interest charges, which can never be realized unless the price of the manufactured product continues to increase.

Although there has been great improvement in accounting methods, in many cases those of to-day are not altogether scientific. Much improvement, however, has been made in this respect within the past few years, due to the progressive spirit of the leaders of the industry, the careful study of its problems by trained economists, and the efforts of the various associations of manufacturers and dealers. These associations have not only studied accounting problems and standardized methods, but they have also given considerable study to the labor problem. The lumber producers on the west coast seem to have established a commendable cooperation between the mill owner and the laborer.

Sharp competition within the producing areas in the past led to overcapitalization and the necessity for cutting timber wastefully in order to pay interest, taxes, and other fixed charges.

The history during the past decade has been one of small margins and close selling—so close, in fact, that in many cases, in hearings before such tribunals as the Federal Trade Commission and the Interstate Commerce Commission, it has been actually shown that operations were being conducted at a loss to many operators.

Prior to the war the Forest Service had made a close analysis of representative operations from 1909 to 1914. Each year during that period shows a decrease in return on the operating investment, the decreases ranging from 3.3 per cent to 13.5 per cent. During the latter part of the year 1915 the average cost per thousand feet was greater than the average realization.

Before the panic year of 1907 there had been a general advance in the price of lumber and there was a general belief that prices were unduly high. Investigation shows that the rises in prices of lumber on the average, however, were only slightly in advance of the general rise in the price level of all commodities. After 1907 lumber fell behind the general advance of other commodities and continued to advance less rapidly than other commodities through the war period.

The price record, 1913–1919.

Four tables of prices on lumber for the years 1913 to 1918 and for the first quarter of 1919 are presented herewith (Tables 21 to 24). Tables 21 and 22 give quotations of actual prices on particular grades and sizes of representative species of lumber. Tables 23 and 24 give average prices for various species, together with relative prices, referred to the year preceding July, 1914, as base. The composite indices in the

last column of Table 24 are those computed by the price section of the War Industries Board.

The quotations used in these tables were furnished by the price section of the War Industries Board. That organization made an extended study of the lumber prices through the war period, a study made by experts in the various phases of the lumber industry. The extensions of the War Industries Board's figures into the year 1919 were made from figures obtained from various trade journals.

The number of grades and sizes usually quoted in the trade journals and also in the report of the War Industries Board on lumber prices is so large that it has been considered advisable to reduce it in this presentation to an exhibit of representative grades and species. More extensive tables can be found in the two reports of the price section of the War Industries Board, one on lumber prices and the other on price fixing by Government agencies.

The composite indices cover averages for species comprising over four-fifths of the total production of lumber. The figure for the last quarter of 1918 indicates a general advance of 73 per cent over the prewar figure. This is rather less than the advances in most other building materials and in most of the other groups of basic commodities.

The curve of the composite price index would follow the general tendency of the curve of the general price level through the six-year period. (See Chart XI, following this section.) The real rise came with the second quarter of 1917, when the United States entered the war. The peak of the curve occurs in the third quarter of 1918, just as does the maximum of all other prices, but the distinguishing feature has been the fact that the lumber curve has lagged behind the other curves and that the decline from September, 1918, was very slight. Lumber prices reacted upward in the spring of 1919. An April index would be approximately 175.

Southern yellow pine and Douglas fir, for which species there was greater demand than for the others, show somewhat greater advances. The figures for the last quarter of 1918 show a rise of 85 per cent on southern yellow pine and a rise of 91 per cent on Douglas fir. Both species advanced somewhat during the first quarter of 1919.

There was a decline in production after the year 1908. At that time the conditions, as pointed out in the paragraph on production, were widely different from 1918 conditions. In 1908, in spite of the curtailment of output, prices of yellow pine declined on the average 45 per cent and those of Douglas fir declined 30 per cent. As the price tables show, decreased production of 1918 was at the same time accompanied by a general increase in prices of nearly 12 per cent over those prevailing during the previous year.

Although the price of lumber began to show signs of increase early in 1916, the increase was to be expected as a result of increased war

demands and the general rise of prices of other basic commodities. In 1917 the lumber committee of the Council of National Defense, in agreement with the Southern Pine Association, and with the approval of the Secretary of War, fixed the first price of about $24.85 for the purchase of yellow-pine lumber for cantonment construction. This price was approximately 60 per cent higher than that of the prewar period.

This price was reduced 75 cents per thousand feet on September 11, 1917; 50 cents per thousand feet on October 11, 1917; and 40 cents per thousand feet on November 11, 1917; making in all a reduction of $1.65 per thousand. Early in 1918 the commercial price advanced and by May was several dollars per thousand feet higher than the Government price. On June 14, 1918, after studying carefully information regarding lumber costs, the price-fixing committee established a maximum price of approximately $4.80 per thousand feet over the former fixed price. This amounted to about $29.65, or about 90 per cent higher than the prewar base price.

This price continued in force on Southern pine until December 30, 1918. After that time the fluctuations were scarcely appreciable. Some of the heavier timbers declined slightly, whereas building lumber advanced in many localities so that the average remained practically the same for the first quarter of 1919 as for the last quarter of 1918.

Increases in production costs, 1913–1919.

In the paragraph on prewar operating conditions, above, it was shown that a number of factors combined to cut the profits on lumber to a fairly small margin on the average, even before war conditions brought increases in production costs.

A chart [1] prepared by accountants of the Southern Pine Association, covering a number of years up to and including the first part of 1919, presents a curve showing the fluctuations of the average realization per thousand feet of lumber in comparison with a curve showing the fluctuations of the average cost of production. The divergence between the two curves varies considerably, but on the average it indicates a margin of 6 to 8 per cent of realization over cost.

Mr. John H. Kirby, president of the National Lumber Manufacturers' Association, in his statement to the Industrial Board of the Department of Commerce on March 22, 1919, said—

(1) That, if the prices of lumber had been so fixed as to secure maximum production and not to secure the continued production by only that relatively small proportion of the more efficient mills whose product was necessary to the war program, the base price on ordinary lumber of fir or pine would have been fixed at more than $40 per thousand feet instead of $26 and $28, respectively.

[1] Exhibit No. 5. Annual Report of Southern Pine Convention, 1919.

(2) That the net increase of lumber prices after the beginning of the war, but prior to the entrance of the United States into it, had been but little more than the increase in production costs.

(3) That in the South the average price received at the beginning of 1919 for lumber by more than 100 mills was $28.60, only 60 cents more than the base price fixed in June, 1918; whereas average producing costs increased more than $3 per thousand feet during that period.

(4) That in the South Atlantic States and North Carolina pine region average costs, as of the first part of the year 1919, were in substantial excess of the prices received per thousand feet.

Estimates have been prepared on the distribution of the average retail price as between the manufacturer, the wholesale dealer, the railroads, and the retail dealer in the Middle Western market before the war and in 1919. These figures are presented in the following table:

Distribution of average retail price—Middle Western markets.

[Comparison of prewar and 1919 prices.]

	Prewar.		1919		Per cent of increase.
	Amount.	Per cent of total.	Amount.	Per cent of total.	
Manufacturer	$15.20	52.2	$28.88	60.2	90.0
Wholesaler	.99	3.4	1.53	3.2	54.5
Railroad	6.15	21.2	7.25	15.1	17.8
Retailer	6.77	23.2	10.31	21.5	52.2
Total retail price	29.11	100.0	47.97	100.0	64.7

Prewar figures taken from averages compiled on operations of yards in 11 Middle Western States by Forest Service, 1912–1915. Report No. 114.
Average freight rate to Central distributing points from Bogalusa, La.

The foregoing table shows an increase in the cost of manufacturing of 90 per cent over the prewar cost. It should be noted that this is only on a comparatively small class of operations in a few markets, and that the average index of wholesale prices for the country at large is not so high. However, this series of operations shows a retail increase of only 64.7 per cent. Of the elements that combine to make up this cost, the cost of manufacturing is by far the greatest. In its relationship to the total price it has increased from 52.2 to 60.2 per cent. In this same relation the proportions accruing to the wholesaler, to the retailer, and to the railroad show an actual decrease.

The relative importance of the factors that enter into manufacturing costs has been estimated by the West Coast Lumbermen's Association for producers in its territory as follows:

	Per cent.
Labor	55
Materials and supplies	10
Repairs, depreciation, and general expenses	22
Stumpage, at $3.18	13
Total	100

The operations for the last half of 1918, according to figures published in annual reports of the West Coast Lumbermen's Association show a loss on 56 operations of $1.93 per thousand feet, or 8.5 per cent. This includes cost of logging, manufacturing, and merchandising.

Machinery and supplies of all kinds, such as belting, tools, etc., probably advanced more, on the average, during the war period than did the average price of lumber. However, the largest element in manufacturing cost being the labor cost, that item is probably argely responsible for the increase in cost of production of lumber.

Increase in labor cost, 1913–1919.

Labor costs in the lumber industry, as in all others, have mounted gradually, in sympathy with the rise in costs of food, clothing, and other necessities. While increases in wages were necessary on account of the rise in the cost of living, labor costs in the lumber industry, according to statements made by representative producers, were also increased by the decrease in the efficiency of labor, due to competition for labor on account of the war-time shortage and the flow of labor into more profitable channels. The following is a schedule of actual wages per day since 1913, furnished by one of the associations on the West Coast:

1913	$2.93	1916	$2.92
1914	2.75	1917	3.64
1915	2.50	1918	5.53

This shows an increase of 88 per cent. When it is recalled that the item of labor comprises about 55 per cent of the total cost of manufacture, it seems probable that the marked increases in prices that have taken place have not netted excessive profits to the producers.

Another interesting comparison is afforded from the southern pine country. A comparison furnished by one of the Delta Mills shows the following increases in labor costs:

Year.	Cost per M.	Wages in cents per hour.	Hours per M feet.
1913	$5.4308	22.46	24.18
1914	4.5817	21.87	20.95
1915	4.2579	19.64	21.68
1916	4.5956	20.38	22.55
1917	5.5218	23.76	23.24
1918	6.7773	29.20	23.21
February, 1919	11.4791	37.81	30.36

The increase shown here amounts in actual cost per thousand feet to 111 per cent; whereas the actual rate per hour shows an increase of only 68.7 per cent. The increased number of hours required to produce a thousand feet is 6.2, a reduction in efficiency of 25 per cent.

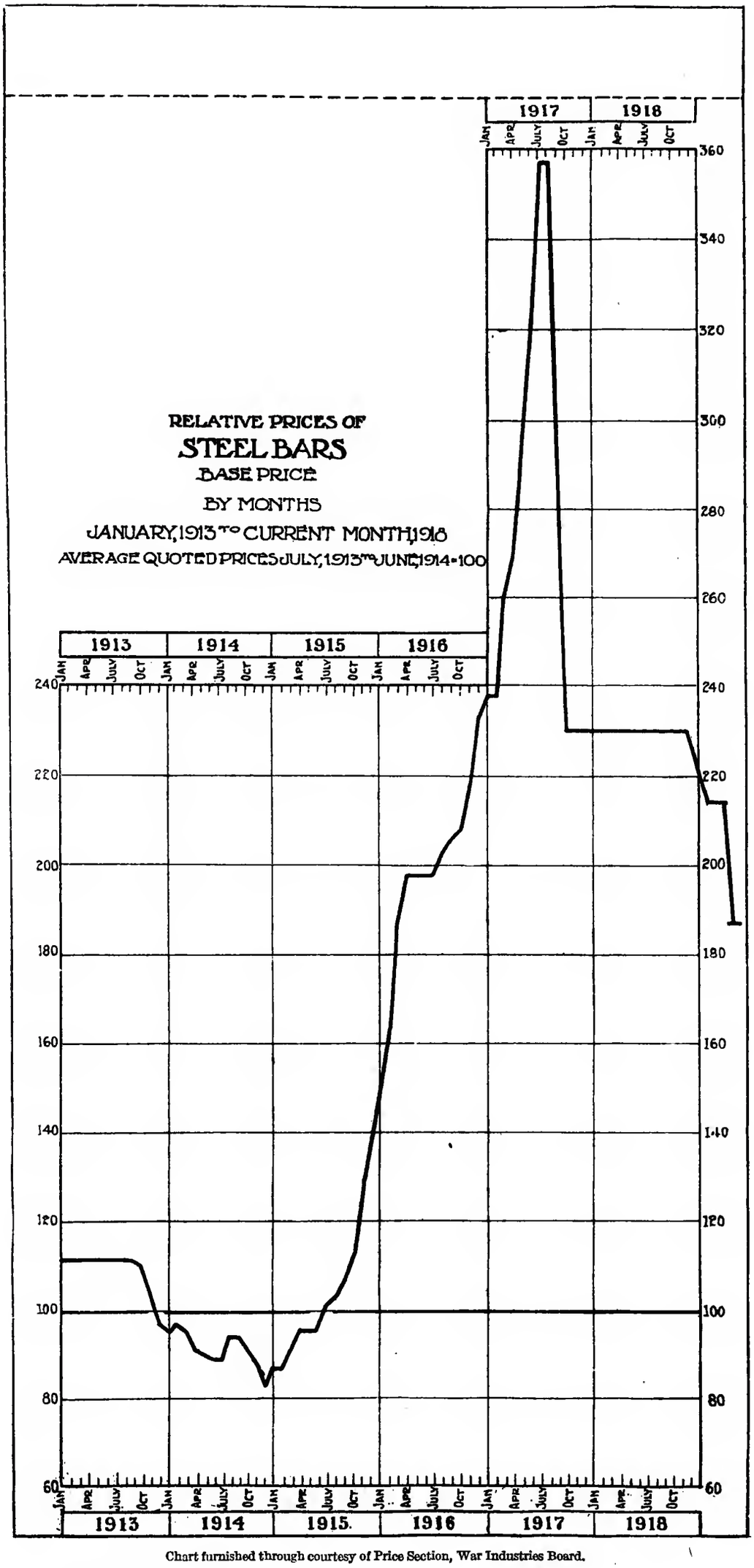


Chart furnished through courtesy of Price Section, War Industries Board.

CHART XII.

121297°—19. (To face page 110.)

Most of the southern lumbermen claim a reduction in efficiency of 50 to 60 per cent.

With cotton selling at a price far in advance of that of former times, and the price of other farm products greatly increased, a great drain has been made upon the sawmill workers of the South in favor of the cotton plantation and the farm. The shipyards called their quota of workers from the Western timber belt. The draft of men for the Army and the epidemics of the 1918 season also contributed to scarcity of labor and the decline in its efficiency in the forests and in the sawmills.

The statement has been made that before the war men might be secured in the logging camps for $55 to $65 per month, whereas to-day they ask $150 to $160. The wages for men engaged in the lumber industry have followed the increase in the scale of wages for relatively unskilled labor in all forms of industry.

The wage scale can scarcely be reduced by any radical method in any quick or effective way. The problem for the future seems to resolve itself again into one of increased production and improvement of method. New machinery, new forms of organization, and scientific study by the associations of lumbermen may determine upon economies. The development of economic methods of timber renewal and reserve ownership may help to release the holders of a great deal of the burden of nonproductive stumpage. Progressive lumber manufacturers rely upon economies of this sort rather than upon attempts at reducing the wage scale for the profitable operation of their business in the future.

Increase in transportation costs, 1914–1919.

The table of freight rates (Table 25) shows increases from 1914 to 1919 on rates between certain markets and producing centers. As the points chosen are rather widely separated, the exhibit may be considered as a fairly representative one. If the average increase of 17.7 per cent on these lumber rates be fairly representative of the general increase in lumber rates, then this commodity came off rather better than most others in the general advance in rates. Perhaps this is one of the reasons why the prices of lumber on the average have risen somewhat less than the prices of most other building materials.

The shorter hauls along the Atlantic coast seem to have had greater increases than the long hauls from the West, thus indicating a tendency to make the eastern markets somewhat more accessible to western producers than was formerly the case.

The table given under the paragraph above, on increases of production costs, 1913–1919, shows that in the ultimate cost to the consumer freight has decreased from 21 per cent of the total to 15

per cent of the total. Freight is to-day less a factor than it was five years ago. These facts all seem to indicate evidence of distinct competition between markets, between roads, and between water and rail transportation. It does not seem probable that there can be any downward revision of the scale of rates under 1919 conditions of markets or rail costs, as the increases in rail rates have not kept pace in recent years with the increases in general costs.

Future price tendencies.

After the signing of the armistice on November 11, 1918, lumber prices showed for four months a tendency to adhere closely to the schedule prevailing in November. In some markets the grades in more common use actually increased in price. The index for the month of April, 1919, is 175, which is two points above the figure for the preceding six months.

So long as the general level of prices remains high, lumber, which has advanced less than most other commodities, could scarcely be expected to decline in price.

Factors that should either tend to maintain lumber prices at the general level of the first half of 1919, or cause them to increase, are the development of the domestic demand, which lay dormant for several years, and the possibilities of foreign demand for necessary works of reconstruction in Europe.

The committee on material cost investigation of the Illinois State Legislature, in its report published May 6, 1919, discussed the various factors affecting lumber prices, such as wages, freight rates, comparisons with prices of other commodities, the diminishing supply of timber, and the prospective increases in demand both in the United States and abroad, and stated as a conclusion that both stumpage values and lumber prices would go up rather than down in the future.

There are factors which should serve as brakes on continued increases in lumber prices. Agencies are continually at work developing more economic methods of transporting and manufacturing lumber and its products. New inventions and labor-saving devices are replacing more expensive forms of labor. Compact organizations are being effected which prevent much of the waste in merchandising and in distribution. There has been no cessation of the fierce competition between timber-producing areas, between the large distributors, and between small retail yards doing business within the same areas. Competition is keener than ever between lumber and materials offered as substitutes for wood in various types of building construction.

Prospects for export trade in lumber.

It has been stated that our exports of lumber in the past have amounted to from 7 to 10 per cent of the total domestic production. There appear to be reasonable expectations of greatly increased demands for American lumber in European markets as the European countries develop their programs for reconstruction.

In the years preceding the war, the world's lumber production was distributed approximately as follows:

	Per cent.		Per cent.
Russia	33	Sweden	12
United States	17	Canada	11
Austria	16	Finland	10

Russia has been practically put out of business as a producer through its political upheaval. Austria's production, for some years following the ending of the war, will be seriously curtailed. Both have heretofore supplied large quantities of lumber to western Europe.

Mr. Roger E. Simmons, one of the trade commissioners sent to Europe by the Bureau of Foreign and Domestic Commerce to investigate the lumber markets, returned to this country early in 1919. He stated that early in 1919 there was not a sawmill running in Russia, except in the Archangel district, where the allies were in control, and that all the other mills were dismantled. He further stated that if the revolution should end at once, Russia would be unable to export any new lumber before 1923.

Exports of lumber in normal years before the war were as follows:

	M feet.		M feet.
Russia	4,650,000	Norway and Sweden	2,575,000
United States and Canada	3,000,000	Austria	2,202,000

The total exports of all countries amounted approximately to 15 billion feet. Mr. Simmons has estimated that Russia's proportion of exports of lumber for the years 1919-1923 should amount to seven billion feet per year, this figure being based on the percentage furnished by Russia to other countries before the war. Mr. Simmons considered Russia's probable actual supply to the rest of Europe for that period as negligible.

England's housing shortage has been variously estimated at from 300,000 to 500,000 houses; France's needs have been estimated at 578,000 houses. These figures give an indication of the demand for lumber that may be expected, a large part of which may be drawn from the United States and Canada.

The United States before the war imported some lumber, about 4 per cent of the domestic production on the average. The greater part of this came from Canada. England will probably use all of

Canada's available surplus for the next few years. Finland can probably make up part of Russia's deficiency. American lumber interests, already organized under the provisions of the Webb law for foreign trade, will probably be called upon to furnish a great deal of lumber to Europe for the next five years.

According to Mr. Simmons's statement, lumber was quoted at Archangel in January, 1919, at more than double the prices quoted in this country for the same grades and sizes, and in Sweden at slightly less than double American prices.

The matter of favorable ocean freight rates will have considerable weight in determining the amount of American competition in European markets.

All the facts being considered, the expectation of lumber manufacturers for a considerable foreign demand seems justified. The effect of such demand would be advances in prices. If the demand develops to large proportions its effect would probably be greater than that of such other factors that might tend to cause declines.

TABLE 21.—*Tables of averages of actual prices on particular grades and sizes.*

Species	Southern pellow pine.					Douglas fir.	
Market	Alabama, Arkansas, Louisiana, Texas, Mississippi.					F. o. b. Washington mills.	
Grade and size	Finish B and better 6 inches and wider.	Common boards 1-s2s 1 by 10 inches.	Common boards No. 2-s2s 1 by 8 inches.	Dimension No. 1-s1s1E 2 by 8-16.	Timbers s1s1E 6 by 8-16.	Common boards No. 1-s1s 1 by 10-20.	No. 2C and better drop siding 1 by 6-16.
1913	$25.0312	$16.7604	$12.7354	$12.4537	$14.4643	$9.2083	$17.3333
1914	23.2227	15.2656	11.2188	11.2083	12.8750	7.9167	14.2917
1915	22.0422	15.4363	11.8519	12.3792	12.9070	7.8750	14.2917
1916	24.6016	18.0438	14.6172	14.9931	15.7679	10.3750	18.5833
1917	33.6094	25.7969	21.4766	19.9792	21.7500	15.8750	23.9167
1918	37.8906	29.8125	26.3438	22.6000	25.5179	18.2500	28.0000
Quarterly averages for 1917:							
First quarter	27.4688	20.1250	16.4688	16.3333	17.4286	11.8333	19.6667
Second quarter	34.3438	26.2500	23.3125	21.9722	22.1429	16.0000	23.6667
Third quarter	36.3125	28.8125	22.4375	20.8611	23.8929	18.5000	26.0000
Fourth quarter	36.3125	28.0000	23.6875	20.7500	23.5357	17.1667	26.3333
Quarterly averages for 1918:							
First quarter	37.2500	29.3125	25.5000	21.4722	25.1429	18.5000	27.0000
Second quarter	38.2500	31.3125	28.4375	23.6667	25.9286	18.5000	27.0000
Third quarter	38.0625	29.0000	25.6250	22.7500	25.4286	19.5000	31.0000
Fourth quarter	38.0000	29.6250	25.8125	22.5556	25.5714	16.5000	27.0000
Quarterly averages for 1919:							
First quarter	37.9500	30.1250	26.8750	25.6250	25.6250	[a]19.5000	30.0000

[a] Dimension, S 1 S 1 E, 2 by 4 substituted.

Above figures from War Industries Board tables except 1918-1919 computed from market quotation published in "Lumber" by Journal of Commerce Co.

TABLE 22.—*Tables of averages of actual prices on particular grades and sizes.*

Species	Oak.	Spruce.		Hemlock.		Eastern white pine.	
Market	West Virginia, Tennessee, Kentucky, Arkansas.	Boston.		Michigan and Wisconsin.		Minnesota and Wisconsin.	
Grade and size	No. 1 common plain white, 4/4.	Covering boards, 5 inches and up.	Random, 2 by 10.	Common boards, S1S, 1 by 8–16.	No. 1 fencing, 1 by 6.	No. 2 boards, 1 by 8–12.	Dimension, No. 1–S1S1E, 2 by 4–16.
1913	$31.3519	$22.9904	$24.7933	$20.4445	$19.8056	$23.5000	$20.5833
1914	28.4722	21.4832	23.9038	18.8333	18.1458	22.8958	20.5000
1915	27.1972	19.6202	23.7115	18.1667	17.2500	23.4167	17.9583
1916	29.2572	21.2075	27.2500	21.4792	20.4792	26.0833	20.7083
1917	34.0264	29.0245	35.5480	27.6458	26.4583	34.0833	27.1667
1918	39.5653	37.9519	44.6538	31.1042	30.1250	40.3333	30.7083
Quarterly averages for 1917:							
First quarter	30.8889	24.1458	33.3077	23.8333	23.1667	29.3333	22.8333
Second quarter	33.7222	29.3846	35.1154	28.7500	27.7500	34.0000	27.5000
Third quarter	35.8833	30.5769	34.3750	29.1667	27.4167	36.3333	29.1667
Fourth quarter	35.6111	31.6154	39.4792	28.8333	27.5000	36.6667	29.1667
Quarterly averages for 1918:							
First quarter	37.7611	33.4615	41.6154	29.1667	27.8333	38.6667	30.1667
Second quarter	40.1667	38.4615	46.0000	30.0000	29.1667	40.6667	30.6667
Third quarter	39.9444	39.9231	45.5000	32.7500	32.0000	41.0000	31.0000
Fourth quarter	40.3889	39.9615	45.5000	32.5000	31.5000	41.0000	31.0000
Quarterly averages for 1919:							
First quarter	40.0000	39.0000	45.5000	33.5000	32.0000	[1] 41.0000	[1] 33.2500

[1] Minneapolis market.

TABLE 23.—*Comparison of averages of actual prices and relative prices on most important species of lumber.*

Species	Southern yellow pine.		Douglas fir.		Eastern white pine.		Hemlock.	
	Average realization.	Relative prices.	Average realization.	Relative prices.	Average realization.	Relative prices.	Average realization.	Relative prices.
Base	$15.2930	100	$11.5417	100	$31.6328	100	$19.0395	100
1913	16.0576	105	13.1575	114	31.9491	101	19.9914	105
1914	14.5283	95	11.0790	96	31.3164	99	18.2779	96
1915	14.6812	96	11.0790	96	30.3674	96	17.5163	92
1916	17.4340	114	14.4271	125	32.5817	103	20.7530	109
1917	24.4688	160	20.4288	177	42.7042	135	26.6553	140
1918	28.4449	186	23.6604	205	51.2451	162	30.2728	159
Quarterly averages for 1917:								
First quarter	19.4221	127	15.9275	138	36.3777	115	23.0377	121
Second quarter	25.5383	167	20.4288	177	42.7042	135	27.7976	146
Third quarter	26.3039	172	23.0834	200	45.2349	143	27.9880	147
Fourth quarter	26.4568	173	22.1600	192	45.8675	145	27.7976	146
Quarterly averages for 1918:								
First quarter	27.8332	182	23.4296	203	48.7145	154	27.9880	147
Second quarter	29.6730	194	23.4296	203	51.5614	163	29.7016	156
Third quarter	28.1391	184	25.6225	222	52.8267	167	31.6055	166
Fourth quarter	28.2920	185	22.0446	191	52.1941	165	31.6055	166
Quarterly averages for 1919: First quarter	29.2000	190	24.7500	214	48.3333	152	32.8750	172

NOTE.—Southern yellow pine, average of prices on 5 grades and sizes. Douglas fir, average of prices on No. 1 common 1 by 8 and No. 2 and better, drop siding. Eastern white pine, average of prices on 8 grades and sizes. Hemlock, average of prices on 4 grades and sizes.

Base, in all cases: Average of prices for year July 1, 1913, to June 30, 1914.

TABLE 24.—*Comparison of averages of actual prices and relative prices on most important species of lumber.*

Species	Spruce.		Cypress.		Oak.		Cedar shingles.		
	Average realization.	Relative prices.	Average realization.	Relative prices.	Average realization.	Relative prices.	Average realization.	Relative prices.	Composite index.
Base	$24.2683	100	$41.8646	100	$27.8000	100	$1.7958	100	100
1913	24.7536	102	42.7399	102	28.6340	103	1.9667	109	105
1914	23.5402	97	41.1203	98	26.4100	95	1.7125	95	96
1915	22.8122	94	40.5857	97	25.0200	90	1.6642	93	94
1916	25.7243	106	42.8933	103	26.9660	97	1.9100	106	109
1917	33.9756	140	49.3003	118	31.4140	113	2.8175	157	146
1918	42.9548	177	61.0926	146	37.5300	135	2.7942	156	172
1917, by quarters:									
First	30.3353	125	45.3974	108	28.3560	102	2.3900	133	122
Second	33.7329	139	46.8726	112	31.1360	112	3.0967	172	150
Third	34.4609	142	52.9769	126	32.8940	118	3.0033	167	156
Fourth	37.6158	155	53.8923	129	33.3600	120	2.7800	154	159
1918, by quarters:									
First	39.0719	161	60.4285	144	35.8620	129	2.8367	158	166
Second	43.6829	180	63.4200	151	38.0860	137	2.9967	167	176
Third	44.6536	184	[1]	[1]	38.0860	137	2.8667	160	176
Fourth	44.6536	184	[1]	[1]	38.3040	138	2.4767	138	173
1919, by quarters: First	43.3181	178	64.5000	154	37.3750	134	2.6500	148	173

[1] No quotations obtainable.

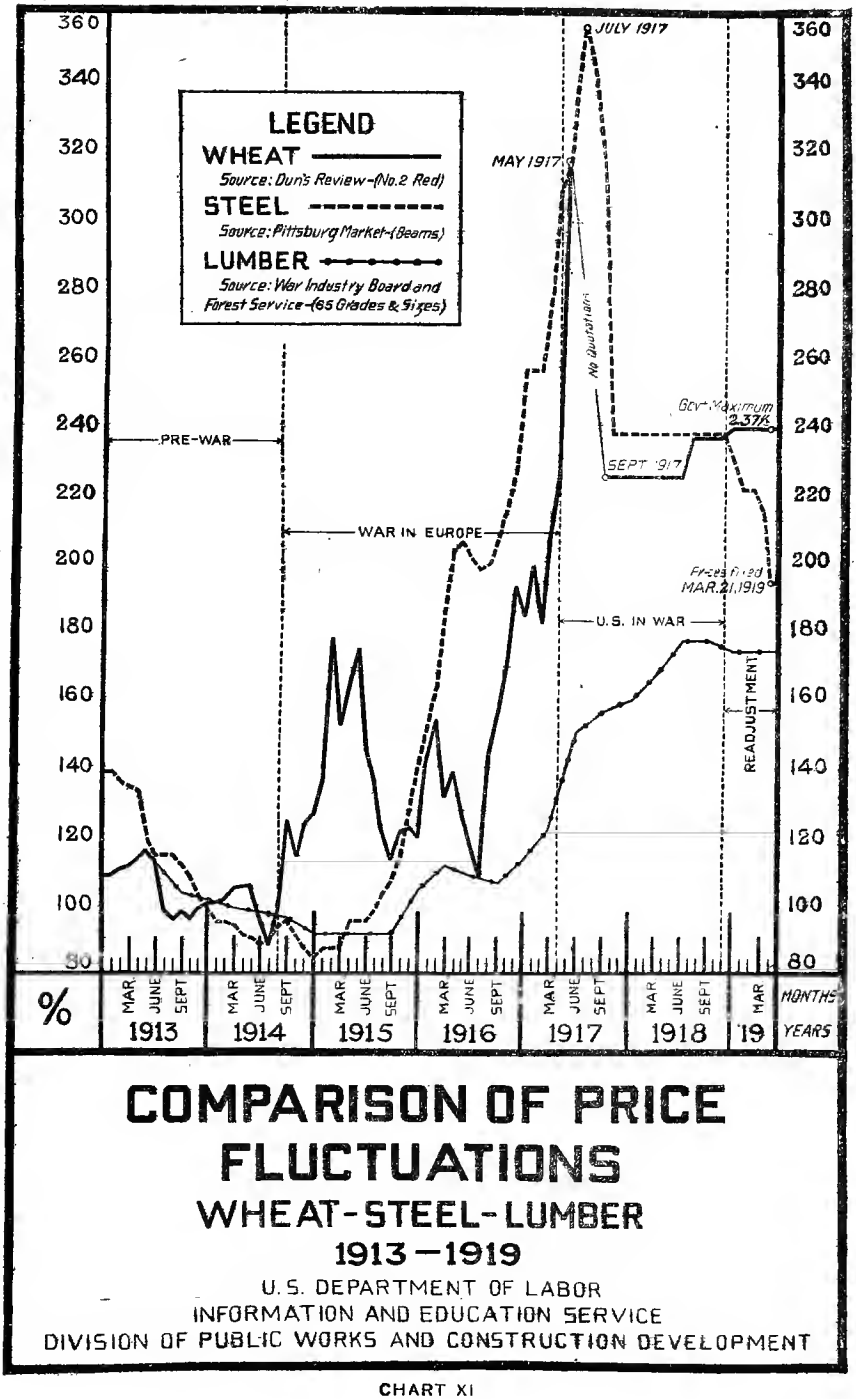
NOTE.—Spruce, average of prices on 11 grades and sizes. Cypress, average of prices on 6 grades and sizes. Oak, average of prices on 4 grades and sizes. Red cedar shingles, average of prices on clear, random, 16-inch.

Base, In all cases: Average of prices for year, July 1, 1913, to June 30, 1914.

TABLE 25.—*Comparison of freight rates on lumber from producing points to centers of distribution.*

[Carload lots per 100 pounds.]

	1911	1919	Per cent increase.
Bogalusa, La., to Chicago	$0.24	$0.32	33.0
Portland, Oreg., to Chicago	.55	.60	9.1
Coeur d'Alene, Idaho, to Chicago	.52	.57	9.6
Wausau, Wis., to Chicago	.08½	.10½	23.0
Average increase			14.4
Bogalusa, La., to Kansas City, Mo	.23	.30	32.0
Portland, Oreg., to Kansas City, Mo	.50	.55	10.0
Coeur d'Alene, Idaho, to Kansas City, Mo	.47	.52	10.6
Wausau, Wis., to Kansas City, Mo	.22	.27	22.8
Average increase			15.5
Bogalusa, La., to Minneapolis	.32	.38	18.8
Portland, Oreg., to Minneapolis	.45	.50	11.1
Wausau, Wis., to Minneapolis	.10	.12½	25.0
Coeur d'Alene, Idaho, to Minneapolis	.42	.47	11.9
Average increase			13.9
Bogalusa, La., to New York	.33	.39	18.2
Wausau, Wisconsin, to New York	.29½	.35½	23.8
Norfolk, Va., to New York	.13	.18½	42.3
Williamsport, Pa., to New York	.13	.18½	42.3
Average increase			26.1
Bogalusa, La., to St. Louis	.18	.22½	25.0
Wausau, Wis., to St. Louis	.18½	.23	25.0
Portland, Ore., to St. Louis	.55	.60	9.1
Coeur d'Alene, Idaho, to St. Louis	.52	.57	9.6
Average increase			13.3
Norfolk, Va., to Boston	.15	.21	40.0
Williamsport, Pa., to Boston	.15	.21	40.0
Average increase			40.0
Norfolk, Va., to Philadelphia	.09	.13	44.5
Williamsport, Pa., to Philadelphia	.09	.13	44.5
Average increase			44.5
General average increase			47.7



COMPARISON OF PRICE FLUCTUATIONS

WHEAT-STEEL-LUMBER

1913—1919

U. S. DEPARTMENT OF LABOR
INFORMATION AND EDUCATION SERVICE
DIVISION OF PUBLIC WORKS AND CONSTRUCTION DEVELOPMENT

CHART XI

SECTION VIII. IRON AND STEEL PRODUCTS USED IN CONSTRUCTION.

General information on the steel industry.

The various conditions affecting war-time prices and production in the steel industry in general are set forth in Section II of this chapter.

Explanation of price table.

Price Table 26 gives quoted and relative prices on structural steel, steel bars, wire nails, rivets, and 6-inch cast-iron pipe. In the absence of price data on concrete reinforcing bars, the price series on merchant's bars is included as being typical of this general class of steel products. The composite index figures given are averages made by a somewhat arbitrary weighting system, structural steel indices having been counted twice to once for each of the others, as indicating in a rough way, its relative importance in construction.

Fluctuations of structural steel prices in comparison with those of lumber and of wheat are shown on Chart XI. Chart XII shows fluctuations of prices of steel bars.

It is interesting to compare the increase in prices on 6-inch cast-iron pipe with the prices of gray-forge pig iron, the raw material from which most cast-iron pipe is made. Comparative figures are given in the table below:

	Gray forge pig iron (per gross ton).	6-inch pipe (per net ton).
July 1, 1913, to June 30, 1914:		
Quoted price	$14.335	$22.2258
Relative price	100	100
December, 1918:		
Quoted price	$36.900	$67.7000
Relative price	258	304
April 8, 1919	$29.650	$57.7000
Relative price	207	259

The figures for gray-forge pig iron are for the Philadelphia market, the source of information being the Iron Age.

In the year 1914 a net ton of pipe cost 55 per cent more than a gross ton of pig iron; in December, 1918, a net ton of pipe cost 84 per cent more than a gross ton of pig iron; and in April, 1919, a net ton of cast-iron pipe cost 94 per cent more than a gross ton of pig iron. The increase in the differential of pipe prices over pig iron prices is probably due, in considerable measure, to the greatly increased labor cost of the manufacture of pipe.

Early in the year 1919 there seemed to be a very large potential demand for cast-iron pipe for various public works projects. Buyers, however, were not willing to make contracts at the prices prevailing and not much activity was displayed in the market. In view of the needs for this product it is possible that the reduced price may be followed by considerable purchases of pipe for these projects that have been delayed.

Freight rates on iron and steel products.

Tables 27 and 28 give freight rates on pig iron and on finished iron and steel materials. These rates are more or less representative. Although the average of the increase in rates is given, it can not necessarily be taken as indicating the average increase in rates the country over, but it may stand as an indication, with a considerable margin of error. It is beyond the scope of this investigation to make any complete survey of freight rates.

TABLE 26.—*Prices of iron and steel products used in construction.*

Period.	1. Structural steel.		2. Steel bars.		3. Wire nails.		4. Rivets.		5. 6-inch cast-iron pipe.		Composite index figure
	Price per cwt.	Relative price.	Price per cwt.	Relative price.	Price per cwt.	Relative price.	Price per cwt.	Relative price.	Price per short ton.	Relative price.	
July 1, 1913, to June 30, 1914	$1.2675	100	$1.26	100	$1.5975	100	$1.7433	100	$22.2258	100	100
1913	1.50	119	1.38	110	1.70	107	1.99	114	23.37	105	112
1914	1.15	91	1.15	91	1.56	98	1.55	89	20.90	94	92
1915	1.30	103	1.31	104	1.66	104	1.62	93	22.94	103	102
1916	2.73	201	2.48	197	2.53	159	3.68	211	31.62	142	185
1917	3.67	290	3.49	277	3.56	223	4.84	278	55.31	249	268
1918	2.99	236	2.89	229	3.50	219	4.52	260	60.65	273	242
Last quarter, 1918	2.97	234	2.87	227	3.50	219	4.40	252	67.70	304	245
January, 1919	2.80	221	2.70	214	3.50	219	4.40	252	66.10	296	237
February, 1919	2.80	221	2.70	214	3.50	219	4.40	252	62.70	282	235
March 11, 1919	2.80	221	2.70	214	3.50	219	4.20	2+1	62.70	282	233
March 25, 1919	2.45	193	2.35	187	3.25	203	4.20	2+1	62.70	282	216
April, 1919	2.45	193	2.35	187	3.25	203	3.70	212	57.70	259	208

1. Structural steel: Market, Pittsburgh; source, the Iron Age. 2. Steel bars: Market, Pittsburgh; source, W. I. B. Bulletin No. 5 and the Iron Age. 3. Wire nails: Market, Pittsburgh; source, the Iron Age. 4. Rivets: Market, Pittsburgh; source, W. I. B. Bulletin No. 5 and the Iron Age. 5. 6-inch cast-iron pipe: Market, New York; source, the Iron Age.
Base: In all cases base equals average of prices from July 1, 1913, to June 30, 1914.

TABLE 27.—*Freight rates on pig iron.*

[Per ton in carload lots.]

From—	To—	1915	1919	Increase.
				Per cent.
Mahoning and Shenango Valley.	Cleveland, Ohio	$0.95	$1.40	47
	Newark, N. J	2.85	4.80	68
	Pittsburgh, Pa	.95	1.40	47
	St. Louis, Mo	3.18	4.60	45
	Albany, N. Y	1.20	1.75	46
Buffalo, N. Y	New England	2.45	3.90	59
	New York and Brooklyn, N. Y	2.40	3.90	62
Virginia furnaces	New England	3.25	4.70	45
Birmingham, Ala	Cincinnati, Ohio	2.90	3.60	24
	Chicago, Ill	4.00	5.00	25
	Cleveland, Ohio	4.00	5.00	25
	New York, N. Y	6.15	7.70	25
	Pittsburgh, Pa	4.90	5.70	17
Average				41

Source: Iron Trade Review.

TABLE 28.—*Freight rates on iron and steel (finished materials).*

[In carload lots, per 100 pounds.]

From Pittsburgh, Pa., to—	1914	1919	Increase.
			Per cent.
New York	$0.16	$0.27	69
Chicago, Ill	.18	.27	50
St. Louis, Mo	.225	.335	49
New Orleans, La	.30	.385	28
Pacific coast	.80	1.25	56
Average			50

Source: Iron Trade Review.

SECTION IX. CLAY PRODUCTS.

Introduction.

The outstanding feature in the clay-products industry for the past decade has been the decline in the relative importance of brick. Common brick reached the peak in quantity of production in the year 1906.

This decline has been accompanied by a considerable increase in production of fire brick, hollow tile, architectural terra cotta, and sewer pipe.

To a fairly considerable extent terra cotta and hollow tile have replaced brick in construction. Perhaps to an even greater extent is the decline in importance of brick due to the vastly increased use of cement in construction.

The number of firms reporting to the United States Geological Survey sales of clay products was largest in 1899, when 6,962 firms were listed. This number declined steadily until 1917, when 3,162 firms reported. This decrease has probably been largely due to the elimination of many of the smaller plants, which has been ascribed to the encroachment of concrete construction practice and to the consolidation of plants for more efficient management.

Imports have consisted chiefly of the highest grades of ware, principally pottery, and have not been a factor in the brick and tile markets. Except for kaolin and china clay, imports of clay are unimportant.

Exports of clay products are also relatively unimportant, fire brick being the most important member of the group in this respect. More than half of our exports of clay products go to Canada. Exports reached the maximum value in 1917, $6,953,263. This figure was 2.8 per cent of the total value of clay products sold in this country in that year.

Production figures, 1908–1917.

Production figures compiled by the United States Geological Survey on the various groups of clay products are shown in Tables 29

to 32. Quantities and average prices are given only on common, vitrified, and front brick. In the case of the other products, figures on quantities are not available. Totals of values for each class of products are given, together with the percentage of the value of each product in terms of the total value of clay products manufactured during the period in question.

These figures show that in the decade 1898–1907 common brick amounted to 39.6 per cent of the total. In the year 1917 common brick was 19.3 per cent of the total. Fire brick amounted to 9.2 per cent of the total in the period 1898–1907; in 1917 they amounted to 23.4 per cent of the total. Hollow building tile accounted for 2.5 per cent in 1898–1907; in 1917 it was 5.3 per cent of the total. Pottery shows a slightly greater relative importance in 1917 than in the period 1898–1907.

The 1917 figure for the total value of clay products is just about double the figure for the average of 1898–1907. This probably does not represent so great an increase in the quantity produced, as prices rose somewhat between 1908 and 1917.

Production in 1917 and 1918.

The production figures for 1918 are only roughly estimated, and are to be understood as liable to a considerable margin of error.

The quantity of common brick produced in 1917 was a little over 20 per cent less than in 1916.

If the 1918 figures are somewhere near correct, then the production of common brick amounted to only 48 per cent of the previous year, and to 38 per cent of 1916.

The year 1917 was characterized by unusual conditions in the clay-working industries. There were strikes, scarcity of labor and raw materials, and unfavorable transportation conditions to be contended with. The year 1918 was freer from strikes, but the curtailment of building operations and the Government order curtailing production to 50 per cent of normal operated to reduce production very considerably. In fact, producers of common brick were almost put out of business by the adverse conditions with which they were confronted.

The order of the Fuel Administration curtailing production called for a reduction of 50 per cent in clay drain tile and clay roofing tile and 25 per cent in hollow building tile. However, the figures do not indicate that these products suffered quite so much as building brick in 1918.

War-time production of refractory products.

The one product of this group which shows a marked increase in 1917 and 1918 is fire brick.

Fire brick increased in value 88½ per cent in 1917 as over 1916. This would probably represent an increase of about 17 per cent in quantity.

The 1918 figures indicate an increase in value of 128 per cent over 1916, which would indicate a probable increase of 12 per cent in quantity produced.

The reason for this increase was the demand for fire brick for use in the munitions industries. Fire brick were in special demand in the erection of by-product coke ovens, which require large quantities of high-grade refractories.

The importance of refractories has grown with the expansion of industry. They are used in the iron and steel industry, in the manufacture of lead and zinc and glass, in bakeries and tanneries, in kitchen stoves and ranges, and in the burning of many clay products.

The increased demand for fire brick proved the salvation of many of the manufacturers of architectural terra cotta. Their product declined in total value more than 50 per cent in 1918. Such manufacturers as had the facilities for the production of fire brick concentrated their attention on this line and tided themselves over the period of depression in this manner.

Regional production.

Clay products are produced in varying amounts in all the States. The States of greatest production, in 1916, were Pennsylvania, Ohio, Illinois, New Jersey, New York, and Indiana. They are named in the order of their importance. Those of least importance were Wyoming, Vermont, and Arizona.

All the States produce common brick. Vitrified brick are produced mainly in the Central West, with some in the Pacific Coast States. Drain tile, sewer pipe, and hollow building tile are also produced mainly in the Central West. Illinois and New Jersey lead in architectural terra cotta. In the production of fire brick Pennsylvania is the leading State, having produced about 36 per cent of the total in 1916. Following Pennsylvania, in the order of their importance, were Ohio, Missouri, Kentucky, and New Jersey, with small amounts in about a dozen other States.

There is not much information available as to the way in which various sections were hit by the curtailment of production in the war period. The Hudson River and Raritan (New Jersey) districts, from which the supply of common brick for New York City is largely drawn, appear to have suffered the greatest decline in production in 1917 and 1918. The Central West probably suffered the least. This accounts for the relatively greater rise in the price of bricks around New York and Philadelphia than elsewhere. The shortage of brick in this region persisted well into the year 1919.

Some production figures on sand-lime brick are available. This particular type of brick is produced mainly in the Middle West. The figures follow:

1913	5,003,300	1916	5,675,000
1914	6,118,500	1917	6,824,000
1915	4,484,000	1918	5,403,800

The 1918 figure is about 21 per cent under 1917. This may be typical of the curtailment of production of clay products in the Middle West.

The price record.

In view of the fact that the production of clay products is so widespread and that the markets are, in the case of most of the products, strictly local, it has been considered advisable to exhibit a number of price series. (See Tables 33 to 40.) It is only in this manner that a comprehensive view of the price situation with respect to these commodities may be obtained. The attempt has been to secure figures more or less typical of various sections of the country and the various markets.

In the case of common brick it is readily seen that the rise has been greatest in eastern markets. This has been explained above in the statement concerning the decreased production in the Hudson River and Raritan districts.

In Table 39 figures on fire clay and fire brick are shown in parallel columns as illustrating the comparative rise in a raw material and a finished product. From these figures it is seen that war conditions caused a rise of 158 per cent in fire brick, but that the raw material rose even more—173 per cent.

Figures on two grades of kaolin are shown in the same table for comparison with the figures on mosaic tile. The kaolin figures are also of interest in comparison with the figures on sanitary pottery, shown under the heading of plumbing supplies in the section on miscellaneous building materials (Section XV).

Table 40 gives index figures on various clay products, as computed from the various price series available, together with a composite index for the clay-products group. This composite index is a weighted average, the weighting factors being based on the average values of the different products for the years 1913 and 1914.

The index on common brick is believed to be typical of the average rise over the country. At least the figure for the last quarter of 1918, showing a general advance of 92 per cent on common brick, is believed to represent accurately the general rise to that period. In computing the other indices there were not so many figures available as in the

case of brick. As a whole, the figures, represent as nearly as possible, the situation in general.

The fact that vitrified brick shows less increase than common brick is probably due to that fact that the greater part of this product is manufactured in the Middle West, where conditions were less drastic than in the East. The same explanation probably holds good for hollow tile.

Cost of production.

There is but little information available on production costs in these industries. Such information of a comprehensive nature would be extremely difficult to get.

The secretary of the War Service Committee on Brick, Mr. R. D. T. Hollowell, attributed increased prices during the war on the product he represented to increased wages, increased costs of raw material and fuel, increased taxes, increased sales expense, and the greatly reduced production in 1917 and 1918. He stated that the increase in transportation costs alone would amount, on the average, to about $1 per thousand. In the same statement Mr. Hollowell said: "Prices on brick have for the last generation been notoriously low. The industry as a whole is said to have made little or no money."

A producer of brick in Minnesota has stated that his 1918 production costs were 83 per cent over the costs in 1913. According to his statement, the labor cost increased 75 per cent; raw materials, 143 per cent; fuel, 123 per cent; transportation, 24 per cent; other elements, 32 per cent. Another producer, in Michigan, reported somewhat smaller increases; 35 per cent in labor cost; 83 per cent in transportation; 24 per cent in other elements. As a whole his production costs in 1918 were 57 per cent above the 1913 figure.

Some producers of sand-lime brick have furnished their figures on increases of production costs. Averages made from these figures are as follows:

Item.	Increase, 1918 over 1913.
	Per cent.
Labor cost	66
Raw materials cost	66
Fuel cost	131
Transportation	95
Other elements	78
Total production cost	81

In the early part of 1919 it was stated that brick, hollow tile, and ceramic tile were being produced at from 25 to 35 per cent of capacity. The situation in the Central West was said to be less serious than in the East. The producers of these commodities have claimed that

their prices were not high in comparison with other commodities, nor in comparison with the production costs.

Report on brick prices by investigating committee of the Illinois State Legislature.

The Illinois State Legislature appointed a committee on material cost investigation, the purpose of which was to investigate and report on prices of building materials prevailing in the State of Illinois. After an investigation covering several months the report of the committee was made public on May 6, 1919. Concerning common brick the report contains the following statement:

Very extensive investigations of the cost of the manufacture of common building brick were made by the commission. We subjected manufacturers to the most rigid examinations as to the cost of manufacture of the product. The brick manufacturers furnished the committee with all data, books, accounts, reports, and calculations asked for. In addition they furnished, upon request, manufacturers' cost sheets and audits of certified accountants for the years 1912, 1913, 1916, 1917, and 1918 for the information of the commission and for comparative purposes. Estimates of the cost of manufacture for the year 1919 were also submitted. These documents have been carefully studied by the commission. Being one of the industries whose production was repressed by the Government during the war for the purpose of conserving fuel the brick industry suffered exceedingly great losses for the years 1917 and 1918. An examination of the audits of the company made by reputable certified accountants in the usual course of business for these years show, beyond question, that these losses were sustained. The principal elements entering into the cost of manufacturing brick are labor, freight and hauling, and fuel. These items comprise nearly 80 per cent of the cost of manufacture. The year 1916 was a favorable year for the brick industry. In 1919 labor, constituting about 35 per cent of the manufacturing cost, has increased 35 per cent over the year 1916. Freight and delivery to job, constituting about 25 per cent of the cost of manufacture, has increased from 1916 to 1919 about 200 per cent on freight and 35 per cent for delivery. Fuel, constituting about 20 per cent of the cost of manufacture, has been increased from 1916 to 1919 about 100 per cent. We have been informed by the brick manufacturers that brick can not be sold for less than $12 per thousand in Chicago, delivered to the job, without depriving the manufacturer of a reasonable profit. This we are not prepared to dispute. It is obvious, with overhead expenses remaining practically the same with a small or large production, that operating at full capacity would insure a lower price than would result if there was a limited production of brick. The commission has been unable to establish, by evidence, that any illegal combinations exist to regulate the price of common building brick. For a limited time during the war the Government permitted agreements of brick manufacturers to be made establishing prices. The agency for this purpose, created with the Government's sanction, has ceased to exist. The Chicago price of $12 per thousand is the lowest price obtaining anywhere in the United States. The only assurance we can give the public is that, with practically capacity production, there may be a slightly lower price for common building brick. The price for Chicago common building brick was established by the Federal Trade Commission at $12 per thousand. The Price Fixing Committee of the War Industries Board, at a meeting held on February 27, 1919, fixed the following prices per thousand f. o. b. trucks or cars at plant; an additional charge of $2 per thousand to be allowed where brick must be trucked or loaded on cars at nearest railroad siding outside plant:

District No. 1.—New England States and New York State north of Albany and east of Mechanicsville:	
Hard burned	$17.50
Light burned or salmon	15.50
Except Duffney Brick Co., Mechanicsville, N. Y.:	
Hard burned	12.50
Light burned or salmon	10.50
District No. 3.—State of New Jersey north of Trenton:	
Hard burned	16.50
Light burned or salmon	14.50
Long Island, N. Y.:	
Hard burned	13.50
Light burned or salmon	11.50
District No. 5—States of Virginia and North Carolina East of Asheville:	Hard.
Adams-Payne & Gleaves, Roanoke, Va	$12.00
Asheville Brick & Tile Co., Fletchers, N. C	12.50
Yadkin Brick Yard, New London, N. C	12.50
Adams Bros., Payne Co., Lynchburg, Va	15.00
Nansemond Brick Corp., Norfolk, Va	16.00
Cherokee Brick Co., Raleigh, N. C	11.00
Fulton Brick Works, Richmond, Va	14.50
Lewis Larson, Suffolk, Va. (Soroco Brick Co.)	15.00
District No. 6—States of Tennessee, North Carolina west of and including Asheville, South Carolina, Georgia, Florida, and Alabama:	
W. B. Bush & Co., Nashville, Tenn	10.50
Dolores Brick Co., Molino, Fla	10.50
Shepherds Bros., Columbus, Ga	10.50
Bickerstaff Brick Co., Columbus, Ga	11.00
Georgia-Carolina Brick Co., Augusta, Ga	11.50
Geo. C. Berry, Columbus, Ga	12.50
Pee Dee Brick & Tile Co., Marion, S. C	12.50
Standard Brick Co., Macon, Ga	12.50
Bibb Brick Co., Macon, Ga	12.50
Cherokee Brick Co., Macon Ga	12.50
Excelsior Brick Co., Montgomery, Ala	13.00
Guignard Brick Works, Columbia, S. C	13.00
Carolina Brick Co., Kingston, N. C	15.00
Chatahoochee Brick Co., Atlanta, Ga	15.00
Birmingham Clay Products Co., Birmingham, Ala	18.00
Southern Clay Mfg. Co., Birmingham, Ala	18.00
District No. 8—State of Pennsylvania, west of Harrisburg (including Metropolitan Brick Co., Canton, Ohio):	
Hard burned	16.00
Except Yingling-Martin Brick Co., Pittsburgh, Pa.—	
Hard burned	18.42
District No. 9—States of Ohio, Michigan, West Virginia, and eastern Kentucky:	
Hard burned	16.00
Light burned or salmon	14.00
Except Geo. H. Clippert & Son Brick Co., Detroit, Mich.—	
Hard burned	14.50
Light burned or salmon	12.50
District No. 10—States of Illinois, Indiana, western Kentucky, and southern Wisconsin, including Madison:	
Hard burned	15.50
Light burned or salmon	13.50
District No. 12—States of Mississippi, Louisiana, Arkansas, Kansas, and Texas, except El Paso County:	
Choctaw Brick & Gas Co., Mansfield, Ark., hard burned	15.00
Coffeyville Vitrified Brick & Tile Co., Coffeyville, Kans., hard burned	12.00
District No. 14—States of California, Nevada, Arizona, New Mexico, and El Paso County, Tex.:	
Hard burned	14.00
District No. 16—States of Missouri, Iowa, Nebraska, and Oklahoma:	
Hard burned	16.50
District No. 18—Chicago district:	
Hard burned	11.00
Sand-lime brick	14.50

Concerning paving brick the following brief statement was made:

The committee finds no evidence of a combination of paving brick manufacturers. Competition between the paving brick and cement manufacturers has resulted in a price for paving brick at a point as low as paving brick can be sold at a reasonable profit. Three paving brick manufacturers of this State have offered to lease their plants to the State at an annual rental of 6 per cent on the fair cash value of their plant investment, or to contract their output to the State at actual cost plus a reasonable profit.

TABLE 29.—*Brick sold in the United States, 1898–1918.*

[Figures from U. S. Geological Survey.]

Period.	Common brick.			Vitrified brick or block.			Front brick.		
	Quantity (thousands).	Value.	Average price per thousand.	Quantity (thousands).	Value.	Average price per thousand.	Quantity (thousands).	Value.	Average price per thousand.
Average 1898–1907	8,398,593	$48,765,986	$5.81	650,820	$6,298,707	$9.68	456,527	$5,552,791	$12.16
Average 1908–1912	8,770,990	51,783,562	5.90	966,081	10,993,809	11.38	727,484	8,668,410	11.92
1913	8,088,790	50,134,757	6.20	958,680	12,138,221	12.66	827,665	9,614,138	11.62
1914	7,146,571	43,769,524	6.12	931,324	12,500,866	13.42	810,395	9,289,623	11.46
1915	6,851,099	42,145,292	6.15	953,335	12,230,899	12.83	855,668	9,535,536	11.14
1916	7,394,202	49,357,411	6.68	941,553	12,236,890	13.00	1,002,762	11,464,614	11.43
1917	5,864,909	47,936,344	8.17	706,934	10,664,560	15.09	757,618	10,391,368	13.72
Average 1908–1917	7,920,052	49,226,114	6.22	932,223	11,474,048	12.31	789,153	9,363,733	11.87
1918[1]	2,820,000	30,000,000	10.65	406,000	8,000,000	19.70	400,000	8,000,000	20.00

[1] Figures roughly estimated.

TABLE 30.—*Clay products sold in the United States, 1898–1918.*

[Figures from U. S. Geological Survey.]

Period.	Common brick.	Vitrified brick.	Front brick.	Fancy or ornamental brick.		Enameled brick.		Fire brick.	
	Per cent of total.	Per cent of total.	Per cent of total.	Value.	Per cent of total.	Value.	Per cent of total.	Value.	Per cent of total.
Average 1898–1907	39.6	5.1	4.5	$332,257	0.3	$531,111	0.4	$11,352,506	9.2
Average 1908–1912	32.2	6.8	5.4	203,103	.1	910,634	.6	15,876,140	9.8
1913	27.6	6.7	5.3	109,703	.1	1,225,708	.7	20,627,122	11.4
1914	26.5	7.6	5.6	124,459	.1	1,075,026	.6	16,427,547	10.0
1915	25.8	7.5	5.8	109,425	.1	835,808	.5	18,839,931	11.5
1916	23.8	5.9	5.5	109,072	.1	827,443	.4	30,806,129	14.9
1917	19.3	4.3	4.2	192,072	.1	889,899	.4	58,012,264	23.4
Average 1908–1917	27.3	6.5	5.3	166,025	.1	940,705	.5	22,409,369	12.7
1918[1]	13.6	3.6	3.6	100,000	.0	400,000	.2	70,000,000	31.7

[1] Figures roughly estimated.

TABLE 31.—*Clay products sold in the United States, 1898–1918.*

[Figures from the U. S. Geological Survey.]

Period.	Stove lining.		Drain tile.		Sewer pipe.		Architectural terra cotta.		Hollow building tile and fireproofing.	
	Value.	Per cent of total.	Value.	Per cent of total.	Value.	Per cent of total.	Value.	Per cent of total.	Value.	Per cent of total.
Average 1898–1907..	$564,223	0.5	$4,566,921	3.7	$7,851,351	6.3	$3,888,741	3.1	$3,084,818	2.5
Average 1908–1912..	517,671	.3	9,137,405	5.7	11,271,409	7.0	6,480,800	4.0	5,115,932	3.2
1913	535,867	.3	8,558,320	4.7	14,872,103	8.2	7,733,306	4.3	8,629,216	4.7
1914	520,585	.3	8,522,039	5.2	14,014,767	8.5	6,087,652	3.7	8,385,337	5.1
1915	459,341	.3	8,879,264	5.4	11,259,349	6.9	4,796,062	2.9	7,800,938	4.8
1916	601,776	.3	10,083,647	4.9	13,577,006	6.5	6,466,336	3.1	9,942,912	4.8
1917	619,882	.2	11,008,163	4.4	17,307,211	6.9	6,173,550	2.5	13,255,433	5.3
Average 1908–1917..	532,561	.3	9,273,845	5.1	12,738,748	7.2	6,366,091	3.6	7,358,450	4.2
1918[1]	.....	.....	10,000,000	4.5	15,000,000	6.8	3,000,000	1.4	10,000,000	4.5

[1] Figures roughly estimated.

TABLE 32.—*Clay products sold in the United States, 1898–1918.*

[Figures from the U. S. Geological Survey.]

Period.	Tile, not drain.		Miscellaneous.		Total brick and tile.		Pottery.		Total.
	Value.	Per cent of total.	Value.	Per cent of total.	Value.	Per cent of total.	Value.	Per cent of total.	
Average 1898–1907....	$3,122,553	2.5	$3,488,256	2.8	$99,230,953	80.5	$23,832,693	19.5	$123,063,646
Average 1908–1912....	5,115,213	3.2	2,663,915	1.7	128,738,001	80.0	32,198,480	20.0	160,936,481
1913	6,109,180	3.4	3,018,316	1.7	143,296,757	79.1	37,992,375	20.9	181,289,132
1914	5,705,583	3.5	3,165,814	1.9	129,588,822	78.6	35,398,161	21.4	164,986,983
1915	5,186,055	3.2	3,716,944	2.3	125,794,844	77.0	37,325,388	23.0	163,120,232
1916	6,475,464	3.1	7,094,149	3.4	159,042,849	76.7	48,217,242	23.3	207,260,091
1917	6,821,221	2.7	8,588,879	3.5	191,860,846	77.2	56,162,522	22.8	248,023,368
Average, 1908–1917....	5,587,357	3.2	3,890,368	2.2	139,327,413	78.7	37,608,809	21.3	176,936,222
1918[1]	5,000,000	2.3	6,500,000	2.9	166,000,000	75.5	55,000,000	24.9	221,000,000

[1] 1918 figures roughly estimated.

TABLE 33.—*Wholesale prices on common brick.*

[Prices per thousand. Quotations from price section, War Industries Board.]

Kind of brick	Common.		Common No. 1.		Common red building (hard) 8½ by 4 inches by 2 5/16 inches.		Common.			
Market	New England States.		New York.		Philadelphia.		Central Massachusetts.		Buffalo.	
Period.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.
July 1, 1913 to June 30, 1914	$6.7192	100	$6.3292	100	$6.5000	100	$7.2600	100	$6.8625	100
1913	6.7417	100	6.6300	106	6.3333	97	7.8283	108	6.7458	98
1914	6.6442	99	5.8467	86	6.5000	100	7.1392	98	6.7250	98
1915	6.6558	99	5.9425	88	6.8542	106	6.9708	96	6.2958	92
1916	7.5750	113	7.7267	122	7.9167	122	9.3208	128	7.0542	103
1917	9.4567	141	8.8933	141	10.8750	167	11.6817	161	9.7083	141
1918	12.0667	179	10.8975	172	13.6250	210	11.6367	160	12.4167	181
1917:										
First quarter	8.7400	130	9.0167	142	10.5000	162	11.3700	156	8.6667	126
Second quarter	9.3100	139	9.4100	149	11.0000	169	12.3167	170	9.5000	138
Third quarter	9.7900	146	8.5967	136	11.0000	169	11.4100	157	10.0000	146
Fourth quarter	9.9867	148	8.5500	135	11.0000	169	11.6300	160	10.6667	155
1918:										
First quarter	10.4167	155	8.5000	134	11.0000	169	11.9867	165	11.0000	160
Second quarter	11.2733	168	9.6433	152	11.6667	179	11.3387	156	11.0000	160
Third quarter	12.9767	193	12.5067	198	14.5000	223	11.4133	157	12.6667	184
Fourth quarter	13.0000	202	12.9400	204	17.3333	267	11.8100	163	15.0000	218
1919:										
First quarter[1]	13.0000	202	15.2200	240	17.3333	267	11.8100	163	15.0000	218
April [1]	13.0000	202	[2] 16.0000	252	16.0000	246	11.8100	163	13.0000	189

[1] Figures estimated from various sources.

[2] From Dun's Review.

TABLE 34.—*Wholesale prices on common brick.*

[Prices per thousand. Quotations from price section, War Industries Board.]

Kind of brick	Buff, fire clay, mill, or common brick.		Shale No. 1.		Buff building.		Kiln run.		Common red building.	
Market	Middle Atlantic States.		Northern Ohio.		Indiana, Fort Wayne and vicinity.		Wisconsin.		Northern Montana.	
Period.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.
July 1, 1913 to June 30, 1914	$6.9792	100	$8.0000	100	$8.0000	100	$6.8750	100	$11.0000	100
1913	6.7125	96	7.9167	99	8.0000	100	6.6667	97	11.0000	100
1914	6.6667	95	8.0000	100	8.0000	100	6.8333	99	11.0000	100
1915	6.0417	86	8.0000	100	8.0000	100	6.8333	99	11.0000	100
1916	7.4583	107	8.0833	101	9.5000	119	7.0625	103	11.0000	100
1917	11.4583	164	9.1250	114	11.0000	137	8.0000	116	11.7917	107
1918	14.3958	206	13.1667	165	12.8333	160	10.2083	149	13.2500	120
1917:										
First quarter	8.9167	128	8.5000	106	10.5000	131	7.5000	109	11.0000	100
Second quarter	10.1667	145	9.0000	112	10.5000	131	7.8333	114	12.0000	109
Third quarter	12.8333	184	9.0000	112	11.5000	144	8.1667	119	12.0000	109
Fourth quarter	13.9167	199	10.0000	125	11.5000	144	8.5000	124	12.1667	110
1918:										
First quarter	13.7500	197	12.0000	150	11.5000	144	9.1667	133	12.5000	114
Second quarter	13,9167	199	13.0000	162	12.8333	160	9.8333	143	12.5000	114
Third quarter	14.7500	211	13.6667	171	13.5000	169	10.5000	153	14.0000	127
Fourth quarter	15.1667	217	14.0000	175	13.5000	169	11.3333	165	14.0000	127
1919:										
First quarter[1]	16.1000	230	.....	.....	14.5000	181	11.3333	165	.....	.....
April[1]	[1] 16.0000	228	.....	.....	14.5000	181	11.3333	165	.....	.....

[1] Filled in from other sources.

TABLE 35.—*Market prices on clay products.*

[Quotations from the Engineering News-Record.]

Market	Cincinnati.[1]		New York.				Chicago.			
Commodity	Common red brick.		Hollow building tile, 4 by 12 by 12.		Sewer pipe, 8-inch.		Common brick.	Sewer pipe, 8-inch.	Hollow building tile, 8 by 12 by 12.	
Period.	Price per thousand.	Relative price.	Price per block.	Relative price.	Price per linear foot.	Relative price.	Price per thousand.	Price per linear foot.	Price per block.	Relative price.
July 1, 1913, to June 30, 1914	$6.8750	100	$0.0600	100	$0.1580	100			$0.1020	100
1913	7.0000	102	.0600	100	.1552	98				
1914	6.7500	98	.0600	100	.1352	87			.1020	100
1915	6.2500	91			.1090	69				
1916	6.7500	98	.0683	114	.1489	94	$6.1667	$0.1210	.1083	106
1917	8.4375	123	.0920	153	.2192	139	7.1667	.1925	.1288	126
1918	12.9375	188	.1001	167	.2578	163	9.5000	.2267	.1313	129
1917:										
First quarter	7.7500	113	.0900	150	.1960	124	6.0000	.1750	.1186	116
Second quarter	8.3333	121	.0930	155	.2217	140	6.6667	.1750	.1247	122
Third quarter	8.5000	124	.0920	153	.2423	153	8.0000	.2100	.1363	134
Fourth quarter	9.1667	133	.0930	155	.2170	137	8.0000	.2100	.1357	133
1918:										
First quarter	11.7500	171	.0950	158	.2240	142	8.0000	.2100	.1370	134
Second quarter	12.4167	181	.0900	150	.2473	157	8.0000	.2100	.1370	134
Third quarter	13.5833	198	.1020	170	.2870	182	11.0000	.2367	.1313	129
Fourth quarter	14.0000	204	.1133	189	.2730	173	11.0000	.2500	.1200	118
1919:										
First quarter	14.0000	204	.1190	198	.2730	173	11.6667	.2500	.1200	118
April	14.0000	204	.1192	198	.2100	133	12.0000	.2500	.1440	141

[1] Figures from price section, War Industries Board.

TABLE 36.—*Wholesale market prices on clay products.*

Figures from the Engineering News-Record.

Market	St. Louis.			Dallas.			San Francisco.	
Commodity	Common brick, salmon.	Hollow tile, 4 by 12 by 12.	Sewer pipe, 8-inch.	Common brick.	Hollow tile, 4 by 12 by 12.	Sewer pipe, 8-inch.	Hollow tile, 4 by 12 by 12.	Sewer pipe, 8-inch.
Period.	Price per thousand.	Price per block.	Price per linear foot.	Price per thousand.	Price per block.	Price per linear foot.	Price per block.	Price per linear foot.
1916	$6.47	$0.0540	$0.1303				$0.0744	$0.1950
1917	7.33	.0540	.1554	$8.37	$0.0712	$0.2073	.0760	.1983
1918	9.71	.0639	.1842	12.19	.0944	.2518	.0965	.2769
1917:								
First quarter	7.00	.0540	.1367		.0700	.1975	.0700	.1800
Second quarter	7.00	.0540	.1550	8.10	.0700	.2025	.0700	.1800
Third quarter	7.33	.0540	.1650	8.10	.0700	.2142	.0820	.2083
Fourth quarter	8.00	.0540	.1650	8.90	.0750	.2150	.0820	.2250
1918:								
First quarter	8.83	.0540	.1650	10.67	.0850	.2150	.0820	.2250
Second quarter	9.00	.0550	.1817	11.00	.0900	.2383	.0880	.2400
Third quarter	9.67	.0700	.1900	11.67	.0943	.2750	.1040	.2977
Fourth quarter	11.33	.0767	.2000	15.43	.1083	.2790	.1120	.3470
1919:								
First quarter	12.00	.0800	.2200	16.07	.1027	.2875	.1125	.3475
April	10.00	.0800	.2100	16.07	.1072	.2875	.1125	.3475
Advance:	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Fourth quarter 1918 over 1916	75	42	53				50	78
Fourth quarter 1918 over first quarter 1917				[1] 90	55	41		

[1] Advance over second quarter, 1917.

TABLE 37.—*Prices on tile and sewer pipe.*

[Prices f. o. b. plant. Quotations from price section, War Industries Board.]

Commodity	Hollow building tile.		Hollow tile blocks, standard size.		4-inch drain tile.		Sewer pipe, salt glazed fire clay.		Sewer pipe, vitrified, salt glaze.	
Market	Illinois, Indiana, Wisconsin.		Central and New England States.		Indiana.		Northeastern United States.		California.	
Period.	Price per short ton.	Relative price.	Price per short ton.	Relative price.	Price per 1,000 feet.	Relative price.	Price per linear foot.	Relative price.	Price per linear foot.	Relative price.
July 1, 1913, to June 30, 1914	$4.0000	100	$3.0000	100	$14.0000	100	$0.0588	100	$0.0600	100
1913	4.0000	100	3.0000	100	14.0000	100	.0588	100	.0600	100
1914	4.0000	100	3.0000	100	14.0000	100	.0633	108	.0600	100
1915	3.5833	90	2.8750	96	14.0000	100	.0638	109	.0700	117
1916	5.3750	134	3.5000	117	18.0000	129	.0704	120	.0800	133
1917	6.2500	156	5.5625	185	20.0000	143	.0750	128	.0900	150
1918	7.5000	187	6.8125	227	27.0000	193	.0800	136	.1300	217
1917:										
First quarter	6.0000	150	4.0833	136	20.0000	143	.0700	119	.0900	150
Second quarter	6.0000	150	5.3333	178	20.0000	143	.0700	119	.0900	150
Third quarter	6.5000	162	6.3333	211	20.0000	143	.0800	136	.0900	150
Fourth quarter	6.5000	162	6.5000	217	20.0000	143	.0800	136	.0900	150
1918:										
First quarter	7.0000	175	6.6667	222	27.0000	193	.0800	136	.1300	217
Second quarter	7.0000	175	6.7500	225	27.0000	193	.0800	136	.1300	217
Third quarter	8.0000	200	7.0000	233	27.0000	193	.0800	136	.1300	217
Fourth quarter	8.0000	200	6.8333	228	27.0000	193	.0800	136	.1300	217

TABLE 38.—*Prices on face brick and paving brick.*

[Price per thousand f. o. b. plant. Quotations from price section, War Industries Board.]

Kind of brick	Face building brick, No. 1, gray.		Face building brick, No. 1, buff.		Paving block repress.		Paving brick No. 1.		Paving brick No. 1, vitrified.	
Market	United States and Canada.		United States and Canada.		Middle Atlantic States.		Northern Ohio.		Illinois.	
Period.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.
July 1, 1913, to June 30, 1914	$12.3333	100	$10.5700	100	$15.1417	100	$15.0000	100	$15.4692	100
1913	12.4000	101	10.5700	100	13.9875	92	14.8333	99	15.4275	100
1914	12.6333	102	11.0000	104	14.4458	95	15.0000	100	15.8050	102
1915	13.0000	105	11.4300	108	12.8708	85	15.0000	100	15.9008	103
1916	13.1142	106	11.5058	109	13.1875	87	14.7500	98	16.0900	104
1917	16.4100	133	14.6583	139	15.0833	99	16.7917	112	16.8492	109
1918	22.0000	178	21.0967	200	21.4875	142	22.2500	148	19.7442	128
1917:										
First quarter	14.6400	119	12.6133	120	12.6667	84	15.5000	103	16.2267	105
Second quarter	17.0000	138	15.3400	145	13.8333	91	17.0000	113	16.5033	107
Third quarter	17.0000	138	15.3400	145	15.0000	99	17.1667	114	16.9467	110
Fourth quarter	17.0000	138	15.3400	145	18.8333	124	17.5000	117	17.7200	115
1918:										
First quarter	19.0000	154	17.4300	165	20.9500	138	19.6667	131	18.0267	117
Second quarter	20.3333	165	19.4300	184	21.0000	139	21.6667	145	17.9633	116
Third quarter	23.6667	192	23.0967	218	21.6667	143	23.6667	158	20.4733	132
Fourth quarter	25.0000	202	24.4300	232	22.3333	147	24.0000	160	22.5133	146
1919:										
First quarter [1]					23.0000	152	24.0000	160		
April [1]					23.0000	152	22.0000	147		

[1] Figures estimated from various sources.

TABLE 39.—*Prices on kaolin and fire-clay products.*

[Prices f. o. b. plant. Quotations from price section, War Industries Board.]

Commodity	Fire clay, ground plastic.		Fire brick, high grade.		Kaolin, low grade.		Kaolin ("China clay"), refined white.		Mosaic tile, clay ceramic.	
Market	Eastern States.		Eastern States.		New England and Middle West.		United States.		New Jersey.	
Period.	Price per short ton.	Relative price.	Price per M.	Relative price.	Price per short ton.	Relative price.	Price per short ton.	Relative price.	Price per square foot.	Relative price.
July 1, 1913, to June 30, 1914	$2.7500	100	$26.0000	100	$3.5000	100	$9.2500	100	$0.1200	100
1913	2.7500	100	25.8333	99	3.5000	100	9.2500	100	.1200	100
1914	2.7500	100	26.0000	100	3.5000	100	9.2500	100	.1200	100
1915	2.7500	100	26.1667	101	3.5000	100	9.2500	100	.1210	101
1916	3.1250	114	31.5833	121	3.5000	100	9.2500	100	.1460	122
1917	6.3125	230	53.6667	195	4.5625	130	13.3625	144	.1867	156
1918	7.1250	259	63.8333	246	6.3333	181	17.3333	187	.2267	189
1917:										
First quarter	5.3333	194	48.0000	185	3.5000	100	9.2500	100	.1647	137
Second quarter	6.4167	234	54.6667	210	4.5000	129	12.1167	131	.1740	145
Third quarter	6.7500	246	56.0000	218	4.5000	129	15.4167	167	.2040	170
Fourth quarter	6.7500	246	56.0000	218	5.7500	164	16.6667	180	.2040	170
1918:										
First quarter	6.8333	248	61.0000	235	6.0000	172	16.0000	173	.2000	167
Second quarter	7.0000	254	63.0000	242	6.0000	172	17.3333	187	.2267	189
Third quarter	7.1667	261	64.3333	247	6.0000	172	18.0000	195	.2400	200
Fourth quarter	7.5000	273	67.0000	258	7.3333	210	18.0000	195	.2400	200
1919:										
First quarter	[1] 7.5000	273	[1] 67.0000	258						
April	[1] 7.2500	264	[1] 64.0000	246						

[1] Estimated.

TABLE 40.—*Relative prices of various clay products.*

Period.	Commodity.								Composite index.
	Common brick.	Vitrified brick.	Front brick.	Fire brick.	Hollow tile.	Drain tile.	Sewer pipe.	Ceramic tile.	
July 1, 1913, to June 30, 1914.	100	100	100	100	100	100	100	100	100
1913	100	97	101	99	100	100	99	100	99
1914	98	103	102	100	100	100	98	100	99
1915	96	98	105	101	93	100	98	101	98
1916	111	100	106	121	118	129	116	122	114
1917	137	116	133	195	155	143	139	156	146
1918	172	151	178	246	177	193	172	189	184
1917:									
First quarter	128	105	119	185	138	143	131	137	136
Second quarter	136	113	138	210	151	143	136	145	147
Third quarter	141	117	138	218	165	143	146	170	154
Fourth quarter	146	129	138	218	167	143	141	170	156
1918:									
First quarter	154	140	154	235	172	193	165	167	170
Second quarter	161	144	165	242	171	193	170	189	177
Third quarter	180	156	192	247	183	193	178	200	190
Fourth quarter	192	164	202	258	184	193	175	200	197
1919:									
First quarter	199	166	202	258	180	.....	175	.....	200
April	194	161	202	246	175	.....	170	.....	195

SECTION X. QUARRY PRODUCTS.

General remarks on the stone industry.

To quote the United States Geological Survey:

Stone has suffered competition for several years past from various types of cheaper structural materials, and a large number of owners of small quarries have closed their works on account of lack of demand, stone having been replaced by concrete and brick. The demand for the more expensive grades of building stone has continued fairly regular, and the decrease caused by the closing of quarries furnishing the cheaper stone has been offset in the grand total by the increase in the output of crushed stone, which at one time was considered only a by-product.

The stone industry is influenced largely by local demand. Construction such as sea walls, river improvement work, construction of roads and reservoirs, etc., and other similar structural work may call for the opening of a quarry in the vicinity of the work, to be abandoned as soon as this work is completed.

Production figures on stone of all kinds.

Table 41 gives the production figures on stone produced and sold in the United States, classified according to kinds. Table 42 gives production figures for stone classified according to uses.

From the first table it is seen that granite and limestone are the most important; and, also, that limestone has grown in importance more than the other kinds. Granite reached its peak of production in the year 1913, which was the maximum year for stone of all kinds, while limestone increased up to and including the year 1917. For the decade 1898–1907 granite represented 20 per cent of the total stone produced and limestone 40 per cent. In 1917 granite was 19 per cent of the total and limestone was 56 per cent. Limestone was the only kind that was greater in total value in 1917 than in 1913.

The second table shows that the most important form in which stone is used is crushed stone. Crushed stone is considered along with sand and gravel in Section XII, on mineral aggregate, and will not be treated in detail in this section.

Second in importance to crushed stone, in normal years, is building stone. This group, however, was overshadowed by that under the heading of "Others" in 1916 and 1917. The latter group includes the limestone used in important metallurgical and chemical industries and as pulverized stone for agriculture; rough trap rock sold to paving cutters and crushing plants, marble used for flux, terrazzo, marble dust, etc.

Paving stone, curbing, flagging, rubble, and riprap have all decreased continuously from 1913. Monumental stone increased somewhat in total value in 1917, but probably did not increase in quantity.

Production figures on building stone.

Table 43 gives figures on the production of building stone by kinds. This shows marked decreases in all kinds, from 1913 to 1917; but limestone shows less decrease than the others.

The building stone produced in 1913 was about 4 per cent less in value than in 1912. The 1914 figure indicates a decrease of 1⅔ per cent from the 1913 figure, which shows that the total production of building stone in 1914 was not greatly affected by the general business depression. Marble was the only kind of stone to show an increase in production for building purposes in 1914.

The general depression which began in 1914 did not exert any severe effect on the building stone industry until 1915, in which year the total value was nearly 18 per cent under the previous year. During the first half of 1915 many important quarries were idle.

Although building activity was very great in 1916, there was not a large proportion of stone buildings. Limestone was the only kind of stone showing an increase; the total value of building stone decreased 2½ per cent from 1915.

The output for 1917 decreased 30 per cent in quantity and 17 per cent in value from 1916. Estimates for the year 1918 indicate a decrease from 1917 of 59 per cent in quantity and 44 per cent in value.

Exports and imports of stone.

In the year 1913 the total stone, including marble, exported from the United States was valued at $1,856,892, or 2.2 per cent of the total value of stone produced. This was the record year in exports.

In the same year imports amounted to $1,606,135. Most of the stone imported is marble and onyx. About 85 per cent of the marble imported in ordinary times comes from Italy.

These figures on exports and imports are so small in comparison with domestic production, that it is readily seen that they would scarcely affect the domestic markets.

Conditions in Great Britain.

The following is quoted from the United States Geological Survey:

The British mineral statistics for 1916 are interesting as an index of what may happen to our own mineral industry, the United States having entered the war under conditions similar to those of Great Britain—that is, both were essentially nonmilitary nations—and both were obliged to withdraw from peaceful pursuits a large percentage of the working population. Unfortunately, the mineral industry of Great Britain is far less diverse than that of the United States, and in the production of metalliferous minerals is relatively unimportant, except for iron ore.

The noteworthy feature of the British statistics is their exhibition of how the production of the essentials has been fairly well maintained, while the nonessentials have fallen off to a much larger extent. Thus, comparing the figures for 1913 with those of 1916, we find that in the former year there was a production of 287,430,473 tons of coal, 15,997,328 tons of iron ore, and 3,280,143 tons of oil shale. In 1916 coal production had declined to 256,375,366 tons, iron ore to 13,494,658 tons, and oil shale to 3,009,232 tons. Turning now to nonessentials, if we may be permitted thus to characterize the rocks, we find that gravel and sand declined from 2,409,152 tons to 1,961,650 tons. Igneous rock declined from 7,098,493 tons to 4,843,176 tons. Limestone declined from 12,740,664 tons to 10,541,573 tons. Sandstone declined from 3,977,303 tons to 1,999,308 tons. If our interpretation be correct, the decline in the production of sand and rock reflects curtailment in domestic building operations, things not immediately necessary having manifestly been postponed. On the other hand, attention has been concentrated on the production of coal and iron, which are indispensable, and their output has been pretty well maintained.

Production figures on slate.

Table 44 gives figures for production of slate in the United States from 1908 to 1918, inclusive.

Production of roofing slate is seen to have undergone something of a decline during the years preceding the war. This is undoubtedly due to the severe competition of cheaper kinds of roofing material. In quantity roofing slate in 1913 was about 6 per cent under the average for 1908–1912; in 1917 it was 32 per cent under the average for 1908–1912. The quantity produced in 1918 was 69 per cent under the 1908–1912 average, and 46 per cent under the figure for 1917.

On the other hand, mill stock, which includes slate used for structural purposes and in connection with electrical work, during the years 1913–1917 averaged 5,502,208 square feet, or an increase of about 4 per cent over the preceding five-year period. The quantity of mill stock produced in 1918 was 12 per cent under the figure for 1917.

The decreases in 1917 and 1918 are to be attributed to the lessened demand occasioned by the inactivity in building. Slate is not used extensively in hastily constructed buildings, such as a large percentage of the new buildings were in 1917 and 1918.

Imports of slate are quite insignificant. Total exports in 1916 amounted to $81,282, which was 1½ per cent of the value of the domestic production for that year. In 1917 exports amounted to $231,703, or 4 per cent of the total domestic production of the year. The principal increase was in slates of the mill-stock group.

Production figures on lime.

Table 45 shows figures on building lime and on all lime produced in the United States. Lime reached its maximum production in 1916, in building lime as well as in the other kinds.

The total for 1917 was 7 per cent under 1916 in quantity, and 28⅓ per cent over 1916 in value; the total for 1918 was 20 per cent under 1917 in quantity, and 1.7 per cent over 1917 in value.

Building lime in 1917 was 13 per cent under 1916 in quantity and 10 per cent over 1916 in value; in 1918, according to the estimated figures, it was 31½ per cent under 1917 in quantity and 18 per cent under 1917 in value.

In 1913 building lime was 38 per cent of the total lime produced; in 1916, 37 per cent; in 1917, 34 per cent; and in 1918 a little under 30 per cent.

Other purposes than building for which lime is used are in chemical works, paper mills, sugar factories, tanneries, in fluxing, and in agriculture. War demands caused increased sales of chemical lime.

The explanation for the decreased production lies in the general curtailment of building operations following the spring of 1917, together with difficulties in securing labor and transportation. Some plants that supply only building lime were closed throughout the year 1918.

Imports and exports of lime are quite insignificant in quantity and value as compared with the total domestic production.

Regional production of stone.

All the States produce some stone. The ranking States, in the order of their importance, are Pennsylvania, Ohio, Vermont, New York, and Indiana.

Of the States and Territories listed in reports of the United States Geological Survey on stone for the year 1917, 16 States east of the Mississippi showed increases in value of output and 11 showed decreases; in the territory west of the Mississippi, 8 States showed an increase, and 11 showed a decrease.

The most important States in the production of granite were, in 1916, Vermont, Massachusetts, North Carolina, California, Wisconsin, New Hampshire, Maine, and Minnesota. Nineteen other States produce granite.

Sixteen States produced basalt and related rocks (trap rock) in 1916. Of these the most important were New Jersey, Pennsylvania, New York, California, Connecticut, and Washington.

In 1916 marble was produced in 19 States and Territories, the most important of which were: Vermont, Tennessee, Georgia, Alaska, Colorado, and New York.

Thirty-eight States produced sandstone in 1916. Of these, the three leading States, Pennsylvania, Ohio, and New York, furnished together 59 per cent of the total.

In the same year 45 States are reported as producers of limestone, the leading ones being: Pennsylvania, Ohio, Indiana, Illinois, New York, and Michigan.

Detailed statistics for 1918 are not available for inclusion in this report. However, some figures are available on Indiana oolitic limestone in the Bedford-Bloomington district, as follows:

Year.	Value of output.	Year.	Value of output.
1913	$3,179,347	1916	$3,480,525
1914	2,718,609	1917	3,384,110
1915	3,018,171	1918	1,961,154

These figures are given because the product of this district has grown to be of such importance in the construction of the better types of buildings. The decrease in 1918 was 42 per cent as compared with 1917, the total value of output in 1918 being the lowest reported since 1904. About 93 per cent of the 1918 figure represents building stone. The large decrease in production was due to railroad embargoes, scarcity of labor, and curtailment of building activities.

Regional production of slate.

In 1916, of the total value of the output of slate, Pennsylvania produced 58.7 per cent; in 1917, 57.7 per cent. In 1916, Vermont produced 30.1 per cent of the total value of the output; in 1917, 32.5 per cent. Virginia produced 3.1 per cent of the total in 1916, and 2.4 per cent of the total in 1917.

Figures on regional production for 1918 are not available. However, early in 1919 one Pennsylvania producer reported his quarries as working at 20 per cent of capacity, and another at 75 per cent of capacity. At the same time a Vermont producer reported that his plant was operating at about 30 per cent of capacity.

Regional production of lime.

The production of lime is fairly widespread, 42 States and Territories being listed by the United States Geological Survey in 1916. In that year the most important producing States were Pennsylvania, Ohio, Virginia, West Virginia, Wisconsin, and Missouri.

In 1918 the total quantity of lime produced was 20 per cent less than in 1917. Production figures by districts for the years 1917 and 1918 are shown in Table 46.

The price record.

Tables 47 to 50 attached give the record of prices for the years 1913–1919 on building and monumental granite; on flagging, curbing, and paving blocks; on limestone and slate; and on building lime.

The figures in the last column of Table 50 are composite index figures on building lime, which are supposed to represent a fair average of the general rise of this product throughout the country. In computing these figures the average annual prices as published by the United States Geological Survey have been combined with averages of the indices obtained from the Price Section of the War Industries Board. These figures show for the last quarter of 1918 a general advance of 97 per cent over the prewar figure for building lime.

The figures in Table 51 are presented as representative indices of the rise in the various kinds of building stone. Those on limestone, granite, and marble are the ones chosen as representative figures by the Price Section of the War Industries Board. The figures on building slate are simple averages of the three series of indices in Table 49. The final series on all building stone is a weighted average of the indices on limestone, granite, marble, and slate.

The figure for the last quarter of 1918 indicates a general rise of 64 per cent on this class of materials during the war period, an increase which is small in comparison with other building materials, as well as in comparison with commodities other than building materials.

In most cases the prices recorded have been f. o. b. point of origin. These index figures do not take into account increases in the cost of transportation.

Cost of production in the building limestone industry.

The foregoing figures show that the building-stone industry was very seriously curtailed during the war. In response to the lessened demand, production decreased. Prices rose considerably, but rather less than the prices of most other building materials.

Early in 1919 it was stated by a representative of the industry that prices were not due to drop. Increased prices were ascribed to increases in the cost of labor, fuel, raw materials, and transportation.

An important producer of Indiana limestone has stated that during the war wages in the industry increased in amounts ranging from 33⅓ to 120 per cent according to the different grades of labor, the average increase for all labor being 55 per cent.

The same producer stated that the cost of steel, delivered at his plant, increased 340 per cent, fuel 220 per cent, and transportation from 30 per cent in some cases to 500 per cent in others.

Figures on wages of stonecutters have been furnished to this division. They are as follows:

Wages of stonecutters in Indiana.

Year.	Wages per hour.	Index.	Year.	Wages per hour.	Index.
1898	$0.35	62	1914	$0.60	108
1908	.50	89	1915	.62½	111
1909	a.50		1917	.67½	120
1913	.56¼	100	1918	.75	133

a Sliding scale, $0.50, $0.56¼, $0.62½.

Wages of other classes of labor in the building-stone industry have been presented as follows:

Hourly wages in the building-stone industry in Indiana.

Classification.	November, 1916.	November, 1918.	Increase.
			Per cent.
Planesmen	$0.35	$0.62½	79
Traveler runners	.30	.39	30
Sawyers	.27½	.37	35
Laborers	.18	.27	50
Blacksmiths	.32½	.62½	92
Channeler runners	.30	.39	30
Rock breakers	.24	.34	42
Average increase			51

Figures from stone producers in the northern Ohio district indicate an average wage increase of 42 per cent for 1918 over 1913; and an average increase in total cost of production of 40 per cent. The figures in the price tables show a smaller rise in prices in this district than elsewhere.

Cost of production in the marble industry.

An important producer of marble in the State of Georgia has stated that from 1913 to 1918 wages increased 70 per cent; fuel, 110 per cent; transportation, 25 per cent; and other elements, 150 per cent; the increase in total production cost was 84 per cent. Labor increased from 40 per cent of this manufacturer's total production cost in 1913 to 60 per cent of the total in 1918.

Another large producer of marble in the State of Missouri stated in March, 1919, that business in his section had suffered somewhat less than in the region east of the Mississippi River. He stated that wages of common labor had increased about 40 per cent from 1913 to 1918 and skilled labor about 30 per cent; fuel cost increased 92 per cent. On the whole, this manufacturer's production cost increased about 28 per cent.

Cost of production in the slate industry.

No detailed figures are at hand concerning production cost in the slate industry. Increased prices have been attributed by producers

in Vermont and in Pennsylvania to wage increases, increase in fuel costs, and increases in transportation rates. One Pennsylvania producer has stated that wages in his district increased 75 per cent.

TABLE 41.—*Value of the different kinds of stone produced and sold in the United States, 1898–1918.*

[Figures from U. S. Geological Survey.]

Period.	Granite.	Basalt and related rocks (trap rock).	Sandstone.	Marble.	Limestone.	Total.
Average 1898–1907	$14,714,466	$2,476,228	$8,623,829	$5,612,897	$20,614,153	$52,041,574
Average 1908–1912	19,792,235	6,033,516	7,631,809	7,321,756	32,996,699	73,776,014
1913	20,733,217	9,134,494	7,248,965	7,870,890	38,745,429	83,732,995
1914	20,160,730	7,865,998	7,501,808	8,121,412	33,894,155	77,544,103
1915	17,864,439	8,489,222	6,095,800	6,916,025	35,229,866	74,595,352
1916	17,456,838	7,666,297	5,603,778	7,033,171	41,309,599	79,069,683
1917	15,544,957	7,570,885	5,512,421	6,330,387	46,263,379	[a] 82,215,671
Average 1908–1917	19,072,136	7,089,448	7,012,182	7,288,066	36,042,592	76,603,787
1918						[b] 63,000,000

[a] Includes $993,642 for miscellaneous quarry products.
[b] Very roughly estimated by Division of Public Works and Construction Development

TABLE 42.—*Value of stone sold from 1913 to 1918, by kinds and uses.*

[Figures from U. S. Geological Survey.]

Year.	Building (rough and dressed).	Monumental (rough and dressed).	Paving.	Curbing.	Flagging.
1913	$18,097,219	$7,212,648	$3,936,448	$2,077,919	$573,638
1914	17,796,552	7,150,293	3,772,383	1,869,676	594,940
1915	15,380,448	6,459,439	3,048,382	1,654,764	500,732
1916	14,677,808	7,372,620	2,730,861	1,611,001	409,665
1917	12,102,914	8,102,493	2,732,434	1,402,980	356,327
1918 [a]	6,750,000				

Year.	Rubble.	Riprap.	Crushed.	Other.	Total.
1913	$1,588,714	$4,204,857	$31,677,871	$14,363,681	$83,732,995
1914	1,256,213	3,736,432	30,161,766	11,259,848	77,544,103
1915	1,094,445	4,193,672	29,173,488	13,089,982	74,595,352
1916	825,330	3,635,167	29,462,552	18,344,552	79,069,683
1917	864,321	2,208,373	29,065,509	25,380,320	82,215,671
1918 [a]			32,843,000		63,000,000

[a] Figures for 1918 estimated.

TABLE 43.—*Building stone—Value of granite, trap rock, sandstone, limestone and marble (rough and dressed) used for building, 1913–1918.*

[Figures from the U. S. Geological Survey Reports.]

Kinds.	1913	1914	1915	1916	1917	1918
Granite	$6,662,428	$6,481,091	$4,702,627	$4,305,517	$3,161,294	
Trap rock	68,690	45,134	52,307	64,277	39,200	
Sandstone	1,874,299	1,825,179	1,416,842	1,316,287	1,043,226	
Limestone	4,509,339	3,896,854	4,056,201	4,570,703	4,115,366	
Marble [a]	4,982,463	5,548,294	[a] 4,864,471	[a] 4,744,606	[a] 3,702,563	
Miscellaneous					41,265	
Total	18,097,219	17,796,552	15,092,448	15,001,390	12,102,914	[b] 6,750,000

[a] Marble for exterior building only. [b] Estimated.

TABLE 44.—*Slate sold in the United States, 1908–1918.*

[Figures from U. S. Geological Survey.]

Year.	Roofing slate.			Mill stock.			Other uses (value).	Total value.
	Number of squares (100 square feet).	Value.	Average price per square.	Quantity (square feet).	Value.	Average price per square foot.		
Average 1908–1912	1,209,894	$4,682,033	$3.86	5,319,610	$941,866	$0.176	$329,366	$5,953,266
1913	1,113,944	4,461,062	4.00	6,312,011	1,233,838	.195	480,576	6,175,476
1914	1,019,553	4,160,832	4.08	5,361,925	977,930	.182	568,025	5,706,787
1915	967,880	3,746,334	3.87	4,576,112	819,672	.179	392,909	4,958,915
1916	835,873	3,408,934	4.08	5,782,842	1,177,260	.20	*a* 752,643	5,338,837
1917	703,667	3,411,740	4.85	5,478,151	1,277,249	.23	*a*1,060,977	5,749,966
1918	377,417	2,198,179	5.82	4,841,133	1,498,264	.309	*b* 600,000	4,296,443

a Includes, in 1916, 4,990,007 school slates, valued at $52,561, and 3,182,159 square feet of blackboard material, valued at $403,502; in 1917, 4,378,490 school slates, valued at $48,828, and 2,650,563 square feet of blackboard material, valued at $413,163.

b Figures for "Other uses" roughly estimated by Division of Public Works and Construction Development.

TABLE 45.—*Lime burned and sold in the United States, 1908–1918.*

[Figures from U. S. Geological Survey.]

Year.	Building lime.			Total lime.		
	Quantity (short tons).	Value.*a*	Average price per ton.	Quantity (short tons).	Value.*a*	Average price per ton.
Average 1908–1912				3,336,036	$13,336,893	$4.00
1913	1,358,099	$6,611,856	$4.43	3,595,390	14,648,362	4.07
1914	1,163,433	5,068,375	4.36	3,380,928	13,268,938	3.92
1915	1,149,733	4,896,990	4.26	3,622,810	14,424,036	3.98
1916	1,509,968	7,859,614	5.21	4,073,433	18,509,305	4.54
1917	1,313,597	8,713,845	6.63	3,786,364	23,807,877	6.29
1918 *b*	900,000	7,160,000	7.96	3,028,000	24,224,000	8.00

a Value given represents the value of bulk lime f. o. b. at point of shipment and does not include weight or cost of barrel or package.

b Figures for 1918 estimated.

TABLE 46.—*Production of lime of all kinds in 1917 and 1918, by districts.*

[Short tons.]

No.	District.	Total, 1917.	Total, 1918.	Decrease (−) or increase (+).
				Per cent.
1	New England States and narrow area east of Hudson River in New York	394,589	314,360	−20
2	All of New York west of Hudson River	85,872	70,410	−18
3	Eastern Pennsylvania, New Jersey, and Maryland	816,929	704,250	−13
4	Western Pennsylvania and West Virginia	502,838	346,270	−30
5	Virginia, North Carolina, and South Carolina	307,195	255,880	−15
6	Ohio	479,856	350,570	−27
7	Michigan	135,920	133,410	− 2
8	Illinois, Indiana, and Missouri	436,875	379,820	−13
9	Iowa, Minnesota, Montana, South Dakota, and Wisconsin	206,859	133,520	−35
10	Tennessee and Kentucky	102,559	119,300	+16
11	Georgia, Alabama, and Florida	66,744	49,730	−30
12	Arkansas, Colorado, Kansas, Nebraska, Oklahoma, and Wyoming	27,082	15,700	−40
13	Texas and New Mexico	52,742	44,710	−14
14	Arizona, California, Idaho, Nevada, Oregon, Utah, and Washington	144,976	92,700	−36
	Undistributed	25,328	17,250	−32
	Total	3,786,364	3,028,000	−20

TABLE 47.—*Prices on quarry products.*

[F. o. b. quarry prices. Quotations from price section, War Industries Board.]

Commodity	Granite building, red, white, and blue.		Granite building, light blue.		Granite, dark monumental.		Granite, monumental, red and gray.	
Market	United States.		Middle West.		United States and Canada.		United States.	
Period.	Price per cubic foot.	Relative price.	Price per cubic foot.	Relative price.	Price per cubic foot.	Relative price.	Price per cubic foot.	Relative price.
Average July 1, 1913 to June 30, 1914	$0.6500	100	$0.5000	100	$1.3500	100	$1.1200	100
1913	.6500	100	.5000	100	1.3458	99	1.1200	100
1914	.6500	100	.5000	100	1.3500	100	1.1200	100
1915	.7000	108	.5000	100	1.3508	100	1.2033	107
1916	.7500	115	.5500	110	1.4208	105	1.2100	108
1917	.8000	123	.6000	120	1.5250	113	1.3750	123
1918	.9000	138	.6700	134	1.9458	144	2.0650	184
1917:								
First quarter	.8000	123	.6000	120	1.4500	107	1.2500	112
Second quarter	.8000	123	.6000	120	1.4833	110	1.2500	112
Third quarter	.8000	123	.6000	120	1.5500	115	1.5000	134
Fourth quarter	.8000	123	.6000	120	1.6167	119	1.5000	134
1918:								
First quarter	.9000	138	.6000	120	1.7333	128	1.7500	156
Second quarter	.9000	138	.6400	128	1.9000	141	2.0700	185
Third quarter	.9000	138	.7200	144	2.0500	152	2.1900	196
Fourth quarter	.9000	138	.7200	144	2.1000	156	2.2500	201

TABLE 48.—*Prices on quarry products.*

[Market prices. First four series from price section, War Industries Board; last two series from the Engineering News-Record.]

Commodity	Stone flagging, sawed.		Stone curbing, 4 inches thick and under.		Granite paving blocks.		Granite paving blocks, 4 inches, and 1-inch blocks, 7 inches to 10 inches long, 4 inches to 4½ inches wide.		Paving stone hasalt block 4 by 7 by 8 inches.	Paving stone 5 inches, dressed.
Market	Cleveland, Ohio.		Cleveland, Ohio.		New Bedford, Mass.		Chicago, Kansas City, Cleveland, Detroit.		San Francisco.	New York.
Period.	Price per cubic foot.	Relative price.	Price per cubic foot.	Relative price.	Price per M.	Relative price.	Price per square yard.	Relative price.	Price per M.	Per square yard.
Average July 1, 1913, to June 30, 1914	$0.3600	100	$0.3000	100	$40.0000	100	$2.0300	100	.....	.....
1913	.3600	100	.3000	100	40.0000	100	2.0900	102	.....	.....
1914	.3600	100	.3000	100	40.0000	100	1.9700	97	.....	.....
1915	.3600	100	.3000	100	41.5000	104	1.9200	95	.....	.....
1916	.3700	103	.3400	113	41.5000	104	1.9200	95	$57.60	$2.37
1917	.4000	111	.4000	133	50.0000	125	2.0800	102	57.75	2.48
1918	.5875	163	.5375	179	50.0000	125	2.1300	105	57.75	2.70
1917:										
First quarter	.4000	111	.4000	133	50.0000	125	2.0800	102	57.75	2.40
Second quarter	.4000	111	.4000	133	50.0000	125	2.0800	102	57.75	2.50
Third quarter	.4000	111	.4000	133	50.0000	125	2.0800	102	57.75	2.50
Fourth quarter	.4000	111	.4000	133	50.0000	125	2.0800	102	57.75	2.50
1918:										
First quarter	.5000	139	.5000	166	50.0000	125	2.1300	105	57.75	2.50
Second quarter	.5500	153	.5500	183	50.0000	125	2.1300	105	57.75	2.70
Thirdquarter	.6500	181	.5500	183	50.0000	125	2.1300	105	57.75	2.80
Fourth quarter	.6500	181	.5500	183	50.0000	125	2.1300	105	57.75	2.80
1919:										
First quarter	.....	.....	.....	.....	.....	.....	.....	.....	57.75	2.80
April	.....	.....	.....	.....	.....	.....	.....	.....	57.75	.....

TABLE 49.—*Prices on quarry products.*

[Quotations from price section, War Industries Board.]

Commodity	Indiana building limestone, buff.		Building stone, gray blockstone.		Slate, green roofing, No. 1 grade, 20 by 10 inches.		Slate, rib, structural, 1 inch thick.		Slate, blue blackboard, ⅞ inch thick.	
Market	United States.		Cleveland, Ohio.		United States.		United States.		United States.	
Period.	Price per cubic foot.	Relative price.	Price per cubic foot.	Relative price.	Price per 100 square feet.	Relative price.	Price per square foot.	Relative price.	Price per square foot.	Relative price.
Average July 1, 1913, to June 30, 1914	$0.2500	100	$0.3450	100	$4.7708	100	$0.1369	100	$0.1384	100
1913	.2500	100	.3450	100	4.6250	97	.1269	93	.1290	93
1914	.2500	100	.3200	92	4.8958	103	.1310	96	.1445	104
1915	.2500	100	.3200	92	5.0000	105	.1112	81	.1143	83
1916	.2625	105	.3275	95	5.2083	109	.1396	101	.1306	94
1917	.3583	143	.3750	109	6.5000	136	.1741	127	.1543	112
1918	.4208	168	.4250	123	7.5833	159	.2399	175	.1605	116
1917:										
First quarter	.3500	140	.3500	101	6.0000	126	.1700	124	.1530	111
Second quarter	.3500	140	.3500	101	6.3333	133	.1694	124	.1488	108
Third quarter	.3500	140	.4000	116	6.6667	140	.1730	126	.1597	115
Fourth quarter	.3833	153	.4000	116	7.0000	147	.1842	135	.1555	113
1918:										
First quarter	.4000	160	.4000	116	7.0000	147	.1953	143	.1641	119
Second quarter	.4000	160	.4000	116	7.3333	154	.2100	154	.1583	114
Third quarter	.4000	160	.4500	130	8.0000	168	.2955	216	.1597	115
Fourth quarter	.4833	197	.4500	130	8.0000	168	.2589	189	.1597	115

TABLE 50.—*Wholesale prices on building lime.*

[Quotations from price section, War Industries Board.]

Commodity	Adams lime, common or masonry.		Lime in bulk.		Lime, eastern common, standard.		Building lime.
Market	New England, New York, and New Jersey.		Chicago.		New York.		United States.
Period.	Price per barrel 280 pounds net.	Relative price.	Price per short ton.	Relative price.	Price per barrel 300 pounds net.	Relative price.	Composite index.[a]
Average, July 1, 1913, to June 30, 1914	$0.9658	100	$4.3750	100	$1.2500	100	100
1913	.9500	98	4.3833	100	.....	.....	101
1914	1.0133	105	4.0000	91	1.2500	100	99
1915	1.0450	108	3.5000	80	1.2396	99	97
1916	1.1083	115	4.6083	105	1.4050	112	108
1917	1.4290	148	6.1667	141	1.7604	141	151
1918	1.9258	199	7.2500	166	2.2948	184	181
1917:							
First quarter	1.3300	138	5.7000	130	1.5917	127	139
Second quarter	1.3300	138	5.9667	136	1.6500	132	142
Third quarter	1.4883	154	6.5000	149	1.9000	152	160
Fourth quarter	1.5675	162	6.5000	149	1.9000	152	163
1918:							
First quarter	1.6467	171	6.5000	149	1.9625	157	157
Second quarter	1.8842	195	7.5000	171	2.1500	172	177
Third quarter	2.0425	211	7.5000	171	2.5000	200	192
Fourth quarter	2.1300	221	7.5000	171	2.5667	205	197
1919:							
First quarter	.....	.....	[b] 9.0000	206	2.7000	216	[b] 211
April	.....	.....	[b] 9.0000	206	2.7000	216	[b] 211

[a] Figures computed from all figures available. [b] Estimated.

TABLE 51.—*Composite index figures.*

[Base: Average for year July 1, 1913, to June 30, 1914.]

Period.	Building limestone.[a]	Building granite.[a]	Building marble.[a]	Building slate.[b]	All building stone.[b]
1913	100	100	100	95	98
1914	100	100	100	99	100
1915	100	110	100	93	100
1916	105	110	110	105	107
1917	143	120	117	131	127
1918	168	134	137	167	154
1917:					
First quarter	140	120	117	125	125
Second quarter	140	120	117	128	126
Third quarter	140	120	117	133	128
Fourth quarter	153	120	117	141	133
1918:					
First quarter	160	120	137	145	135
Second quarter	160	128	137	154	140
Third quarter	160	144	137	192	159
Fourth quarter	193	144	137	179	164
1919:					
First quarter					164

[a] Figures of price section, War Industries Board.
[b] Figures computed by Division of Public Works and Construction Development.

SECTION XI. PORTLAND CEMENT.

Introduction.

The growth of the Portland cement industry in the United States since the year 1870 is very well indicated by the production figures given below. The average mill price per barrel for each period is given also. These figures show that the increased production was accompanied by a decrease in prices. The general decrease in prices is probably largely responsible for the greatly increased use of cement in all kinds of construction. The production figures follow:

Portland cement in the United States.[a]

Period.	Quantity (barrels).	Average price per barrel.	Period.	Quantity (barrels).	Average price per barrel.
1870–1879	82,000	$3.00	1910	76,549,951	$0.891
1880–1889	1,477,000	1.98	1911	78,523,637	.844
1890–1899	17,282,834	1.60	1912	82,438,096	.813
1900–1909	333,832,412	.99			

[a] Figures from the U. S. Geological Survey.

Natural and puzzolan cements have decreased in importance in this country until, at the present time, they are insignificant as compared with Portland cement. In 1880 the production of natural cement amounted to 2,030,943 barrels, the average value being 85 cents per barrel. In that year the Portland cement produced amounted to 42,000 barrels, with an average value of $3. In 1917

natural and puzzolan cements combined amounted to 639,456 barrels, or less than 1 per cent of the amount of Portland cement produced in that year. The average value of natural and puzzolan cements in 1917 was 68 cents per barrel.

In the year 1900 imports of cement amounted to about 14 per cent of the domestic production of cements of all kinds. In 1910 the imports amounted to about one-half of 1 per cent of the domestic production, and since 1910 the imports have been so small as to be practically negligible.

Exports of Portland cement in 1900 amounted to a little over 1 per cent of the total quantity produced. In 1917 they amounted to 2.8 per cent of the total quantity produced. While the amount of exports has grown somewhat, still the export trade is not yet sufficiently large to materially affect prices of Portland cement in the American markets.

Portland cement produced in the United States, 1913–1918.

Table 52 gives the figures on production, value, and average price per barrel of Portland cement by years from 1913 to 1918. These figures show that production in 1918 was 11 per cent under the average for the preceding 10 years and 23 per cent under the figure for the year 1917.

The stocks on hand at the mills at the close of the year 1918 amounted to 10,594,000 barrels, which is practically the same as the average figure for the preceding five years. Consequently, the decrease in consumption amounted to practically the same as the decrease in production.

The decline in production in 1918 varied in different sections of the country. In New England the decrease from 1917 was about 25 per cent, in the Middle Atlantic States about 18 per cent. In the Southern States east of the Mississippi the production was practically the same as in 1917. In the Central West production declined 28 per cent; in Louisiana and Arkansas, 9 per cent; in the Northwest, 30 per cent; in the Southwest, 21 per cent; in the Rocky Mountain States, 30 per cent; and on the Pacific coast, about 21 per cent.[1]

The fact that a high level of production was maintained in the Southern States in 1918 was probably due to the demands for various kinds of construction work for the Government.

Mill prices on Portland cement.

As has been pointed out, Portland cement declined from $3 per barrel in 1880 to 81 cents per barrel in 1912. During this period practically all other materials advanced in price. The decline in cement prices has been largely due to the development of large-scale production with improved methods.

[1] These statements are based on figures furnished by the Portland Cement Association.

The production table (Table 52) gives the yearly average price per barrel. These figures are based on net prices f. o. b. plants. They give the most representative figures for the country as a whole.

The 1918 average price, $1.59 per barrel, was the highest yearly average recorded since 1898.

Table 53 gives price figures of the United States Geological Survey by districts. Index figures based on these prices have been computed. The average for the years 1913 and 1914 has been taken as the base, in order to make these index figures comparable with those furnished by the price section of the War Industries Board, for which the average for the year previous to July, 1914, has been taken as the base.

This table shows a relatively greater increase in the eastern part of the United States than in the West, although actual prices have continued higher in the West than in the East.

The averages of the index figures for districts 1, 2, 3, 4, and 6 are given for the purpose of comparison with the average figures of the price section of the War Industries Board for the Eastern and Middle Western States. These figures are seen to be in very close agreement.

This average for the Eastern and Middle Western States has been chosen by the price section of the War Industries Board as typical of the whole country. The index figures are shown to be in close agreement with the averages for the whole country, as obtained from the figures of the Geological Survey.

Table 54 gives quoted prices and index numbers from figures of the price section of the War Industries Board. One price series on natural cement is included. These are f. o. b. plant prices.

Prices for the first quarter of 1919 have been, in general, the same as for the last quarter of 1918. Reductions in the net price (i. e., not including the charge for sacks, which is refunded when the sacks have been returned) of 15 cents per barrel in the East, 10 cents per barrel in the region surrounding Pittsburgh, and 5 cents per barrel in the region contiguous to Chicago, were made in the month of April.

Market prices on Portland cement.

Table 55 gives market prices on cement. One series of mill prices is included also.

In taking prices from trade journals some confusion is apt to arise as between wholesale prices (carload lots to dealers) and retail prices (dealers' prices delivered on the job). It has been considered advisable in this report to give only wholesale prices.

Most cement is sold in cloth sacks, four to the barrel. The market quotations usually include a charge for the sacks, the amount of this charge being refunded when the sacks are returned to the mill. On

the average the consumer loses about one-eighth of the bag refund, owing to loss and damage of the bags. It has been considered best to report in these tables net prices (i. e., with the bag refund deducted from the quoted prices).

In most markets the bag charge was 40 cents per barrel up to September, 1918; from September, 1918, to March, 1919, inclusive, it was $1 per barrel; and in April, 1919, it was reduced to 60 cents.

Government control.

In 1918 the fuel supply of the cement mills was restricted to 75 per cent of normal by the Fuel Administration.

Cement prices to be paid by the Government on Government orders were fixed by the price-fixing committee of the War Industries Board in 1917 for the remainder of that year and the first four months of 1918. They were again fixed on May 4, 1918, and on August 23, 1918, for the remainder of the year. The August 23 schedule gave the same net prices as the May 4 schedule. These price schedules did not hold for private purchasers.

The prices (per barrel, exclusive of packages) adopted by the price-fixing committee are given below:

Place.	1917 and first 4 months, 1918.	Last 8 months, 1918.	Place.	1917 and first 4 months, 1918.	Last 8 months, 1918.
Hudson, N. Y.	$1.40	$1.85	Portland, Colo.	$1.70	$1.75
Lehigh Valley, Pa.	1.30	.....	Trident, Mont.	1.70	1.90
Pittsburgh, Pa.	1.50	.....	Devil's Slide, Utah	.....	1.90
Northampton, Pa.	.....	1.75	Brigham, Utah	.....	1.90
Universal, Pa.	.....	1.75	Salt Lake City, Utah	.....	1.90
Fordwick, Va.	1.40	1.70	Irvin, Wash.	1.70	1.95
Kingsport, Tenn.	1.40	1.65	Concrete, Wash.	.....	1.95
Richard City, Tenn.	1.40	1.65	Seattle, Wash.	1.90	.....
Bellevue, Mich.	1.50	1.80	Tacoma, Wash.	1.70	.....
Mitchell, Ind.	1.50	1.70	Portland, Oreg.	1.70	.....
Buffington, Ind.	1.40	1.60	Oswego, Oreg.	.....	2.00
La Salle, Ill.	.....	1.70	Stockton, Calif.	1.70	.....
Steelton, Minn.	1.55	1.70	Oakland, Calif.	1.70	.....
Mason City, Iowa	1.55	1.70	San Francisco, Calif.	1.70	.....
Hannibal, Mo.	1.50	1.70	Santa Cruz, Calif.	1.70	.....
Iola, Kans.	1.50	1.75	Santa Barbara, Calif.	1.70	.....
Harrys, Tex.	1.30	1.70	Los Angeles, Calif.	1.70	.....
Houston, Tex.	1.40	1.80	Cement, Calif.	.....	1.95
San Antonio, Tex.	.....	1.95	Davenport, Calif.	.....	1.95
El Paso, Tex.	1.90	1.95	Crestmore, Calif.	.....	1.95
New Orleans, La.	1.78	.....			

Cost of production.

It has been stated that the prices of May 4, 1918, were fixed after considerable investigation by the Federal Trade Commission. In arguing for a higher price the War Service Committee of the cement industry maintained that manufacturers of cement were operating at three-fourths normal capacity and, that, consequently, the overhead costs were relatively greater than in times of normal production. They further stressed the increased labor and fuel costs. The industry apparently adopted a policy of protecting all its members, so

that the prices were fixed at a high enough figure for all producers to operate.

In the month of March, 1919, a producer in Michigan stated that prices would come down when the cost of labor and fuel lessened. At the same time a California firm stated that its prices had not increased as much as its production costs, claiming that wages had increased 75 per cent in the past two years. A Missouri producer claimed to have lost money every month since August, 1918. A Texas producer stated that prices were not due to drop, owing to high prices of commodities in general, high wages, and high cost of fuel and supplies.

The price concessions in April, 1919, may have been made in anticipation of increased production, which would lower the relative amount of overhead charges. The cost of fuel had declined somewhat at that time.

On the whole, the cement industry has steadfastly maintained its inability to make large concessions on prices.

Concerning cement, the report of the investigating committee of the Illinois State Legislature, published May 6, 1919, contained the following statements:

The commission encountered grave difficulties in investigating the cost of manufacturing cement. The Lehigh Cement Co., operating 14 cement plants throughout the country, through its vice president, stated that the actual cost of manufacturing cement per barrel was $1.4466 in 1918 and $0.6253 in 1913; that the profit per barrel in 1918 was $0.111 and in 1913 was $0.1967; that the profit on invested capital in 1918 was 5.92 per cent and in 1913 was 11.66 per cent. This company offered to submit all of its cost sheets and audits to any reliable certified accountant appointed by the commission. The records of this company are kept at Allentown, Pa., and it would require several months to make an examination to ascertain the cost of production of cement for the years named in the resolution. It took representatives of the Federal Trade Commission three months to examine the books of this company. An Illinois cement company presented its cost sheets and audits for the year 1918. It also furnished the commission with its monthly reports for the year 1918, sworn to, and being exact copies of the same reports furnished to the War Industries Board, These reports contain an itemization of the elements of production cost of cement. stating the total cost of the respective items, and the cost of each item per barrel.

The table is as follows:

Actual cost of plant operating at 4,000 barrels, year 1918.

Summary:	
Total number of men	333
Which equals 12 barrels cement per man employed.	
Mill superintendence and labor (including power labor)	$0.2594
Quarry labor	.1085
	.3679
Quarry:	
Labor for raw materials, including shale	.1085
Dynamite	.0510
Power and operation material	.0223
	.1818

Manufacturing cost per barrel, including packing:	
Raw material	$0.1818
Superintendence and mill labor	.2594
Fuel for drying	.0033
Kiln fuel	.2201
Power coal	.1342
Gypsum	.0299
Repairs and incidentals	.0920
Oil and waste	.0067
Depreciation	.1139
	1.0413
Administration and overhead expenses:	
Executive officers (including general officers)	.1246
Insurance	.0175
Selling	.0798
Taxes	.0038
Interest	.0137
Legal	.0044
Spec. mine expense	.0599
Rock depletion	.0092
Commissions	.0205
Package expense	.0296
Discounts	.0348
Allowances	.0096
Consignment expense	.0045
Interest, $4,000,000, at 7 per cent	.2126
	.6245
Total manufacturing, including packing and administration	1.6658

Freight rates on cement.

The rate table (Table 56) gives some representative rates on cement together with percentages of increase. The increase of freight rates accounts for the relatively greater increase in market prices than in f. o. b. plant prices.

TALLE 52.—*Portland cement produced in the United States.*

Year.	Quantity (barrels).	Value.[a]	Average price per barrel.
Average, 1908–1912	70,716,145	59,575,515	$0.843
1913	92,097,131	92,557,617	1.005
1914	88,230,170	81,789,368	.927
1915	85,914,907	73,886,820	.831
1916	91,521,198	100,947,881	1.103
1917	92,814,202	125,670,429	1.354
Average, 1913–1917	90,115,522	94,970,423	1.054
1918	[b] 71,632,000	[b] 113,894,880	1.59

[a] Values based on selling price of cement in bulk at the mills, including cost of labor and packing, but not the value of the sacks or barrels.
[b] Estimated.

TABLE 53.—*Mill prices on Portland cement, by districts.*

[Average prices per barrel f. o. b. plant. Quotations from U. S. Geological Survey.]

District	1. Lehigh District (eastern Pennsylvania and western New Jersey.		2. New York State.		3. Ohio and western Pennsylvania.		4. Michigan and northeastern Indiana.		5. Southern Indiana and Kentucky.	
Period.	Price per barrel.	Relative price.	Price per barrel.	Relative price.	Price per barrel.	Relative price.	Price per barrel.	Relative price.	Price per barrel.	Relative price.
Average, 1913–1914	$0.824	100	$0.925	100	$0.938	100	$0.995	100	$0.862	100
1913	.838	102	.934	101	1.000	107	1.030	103	1.008	117
1914	.809	98	.917	99	.876	93	.960	97	.717	83
1915	.699	85	.766	83	.855	91	.944	95	.703	81
1916	.944	115	1.027	111	1.113	119	1.168	117	1.106	128
1917	1.220	148	1.304	141	1.382	147	1.427	143	1.352	157
1918	1.532	186	1.616	175	1.500	160	1.655	166	1.598	185

District	6. Illinois and northwestern Indiana.		7. Maryland, Virginia, and West Virginia.		8. Tennessee, Alabama, and Georgia.		9. Iowa, Missouri, and Minnesota.		10. Nebraska, Kansas, Oklahoma, and central Texas.	
Average, 1913–1914	$0.967	100	$0.871	100	$0.917	100	$1.007	100	$0.997	100
1913	1.002	104	.865	99	.899	98	1.074	107	1.063	107
1914	.932	96	.877	101	.935	102	.940	93	.930	93
1915	.907	94	.816	94	.756	82	.882	87	.872	87
1916	1.056	109	1.009	116	.980	107	1.187	118	1.168	117
1917	1.367	141	1.265	145	1.233	134	1.485	148	1.453	146
1918	1.466	152	1.629	187	1.337	146	1.646	164	1.649	165

District	11. Rocky Mountain States—Colorado, Utah, Montana, and western Texas.		12. Pacific Coast States—California, Washington, and Oregon.		Average for United States.		Average, districts 1, 2, 3, 4, 6.		Eastern and Middle Western States.[a]	
Average, 1913–1914	$1.312	100	$1.369	100	$0.966	100	.....	100	$0.9895	100
1913	1.319	101	1.461	107	1.005	104	.....	103	.9999	101
1914	1.306	99	1.277	93	.927	96	.....	97	.9537	96
1915	1.289	98	1.375	101	.860	89	.....	90	.8934	90
1916	1.527	116	1.458	107	1.103	114	.....	114	1.1092	113
1917	1.664	128	1.399	102	1.354	140	.....	144	1.4413	146
1918	1.818	138	1.899	139	1.590	165	.....	168	1.6671	168

[a] Price section, War Industries Board. Base: Average, July 1, 1913, to June 30, 1914.

TABLE 54.—*Mill prices on Portland cement.*

[Average net prices f. o. b. plant. Quotations from price section, War Industries Board.]

Market	1. New York and New England.		2. New England and Middle States.		3. Ohio, Indiana, Illinois, and Michigan.		4. Northern Ohio.	
Period.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.
July 1, 1913, to June 30, 1914.	$1.0808	100	$0.9000	100	$1.0042	100	$1.0270	100
1913	1.0442	97	.9000	100	1.0408	104	1.0406	102
1914	1.0500	97	.9000	100	.9600	96	.9830	96
1915	.8142	75	.8292	92	.9617	96	.9545	93
1916	1.0342	96	1.0917	121	1.2000	119	1.1220	109
1917	1.3358	124	1.4750	164	1.5725	157	1.4472	141
1918	1.6733	155	1.8333	204	1.7633	176	1.6374	159
1917:								
First quarter	1.1867	110	1.4000	156	1.3867	138	1.2947	126
Second quarter	1.4033	130	1.5000	167	1.6033	160	1.4453	141
Third quarter	1.4100	130	1.5000	167	1.6567	165	1.4530	142
Fourth quarter	1.3433	124	1.5000	167	1.6433	164	1.5957	156
1918:								
First quarter	1.5300	141	1.6330	181	1.7000	169	1.5150	148
Second quarter	1.6333	151	1.9000	211	1.7567	175	1.6837	164
Third quarter	1.7300	160	1.9000	211	1.7667	176	1.6837	164
Fourth quarter	1.8000	166	1.9000	211	1.8300	182	1.6673	162

Market	5. Illinois.		6. Upper New York State.		7. Average for Eastern and Middle Western States.		8. Natural cement. Kansas, Missouri, Oklahoma, Nebraska.	
July 1, 1913, to June 30, 1914.	$0.9595	100	$0.9658	100	$0.9895	100	$0.5000	100
1913	.9906	103	.9833	102	.9999	101	.5000	100
1914	.9052	94	.9240	96	.9537	96	.5000	100
1915	.8821	92	.9191	95	.8934	90	.5000	100
1916	1.1144	119	1.0929	113	1.1092	113	.6000	120
1917	1.3975	146	1.4199	147	1.4413	146	.6500	130
1918	1.5500	162	1.5453	160	1.6671	168	.8500	170
1917:								
First quarter	1.2930	135	1.2873	133	1.3081	132	.6500	130
Second quarter	1.4100	147	1.4163	146	1.4630	148	.6500	130
Third quarter	1.4557	152	1.5020	155	1.4962	151	.6500	130
Fourth quarter	1.4313	149	1.4740	152	1.4979	151	.6500	130
1918:								
First quarter	1.4953	156	1.4467	150	1.5533	157	.8500	170
Second quarter	1.5787	164	1.5740	163	1.6877	170	.8500	170
Third quarter	1.5610	163	1.5973	165	1.7064	172	.8500	170
Fourth quarter	1.5650	163	1.5630	162	1.7209	174	.8500	170

TABLE 55.—*Wholesale prices on Portland cement.*

[Net prices for carload lots.]

Market	F. o. b. plant western Washington.[a]		New York.[b]		Chicago.[c]		St. Louis.[c]	Cincinnati.[c]	Dallas.[c]	San Francisco.[c]
Period.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Quoted price.	Quoted price.	Quoted price.
July 1, 1913, to June 30, 1914.	$1.3842	100	$1.1800	100	$1.1500	100	.....	.....	.....	.....
1913	1.5218	110	1.1800	100	[d]1.0500	91	.....	.....	.....	.....
1914	1.2750	92	1.1800	100	1.1500	100	.....	.....	.....	.....
1915	1.5150	109	1.0300	87	1.1500	100	.....	.....	.....	.....
1916	1.5467	112	1.2950	109	1.3850	120	$1.45	.....	.....	$1.89
1917	1.7158	124	1.6740	141	1.7807	155	1.85	.....	.....	1.97
1918	1.8742	136	2.0800	176	1.9675	171	2.26	$2.40	$2.29	2.37
1917:										
First quarter	1.6333	118	1.5366	130	1.5930	139	1.56	.....	.....	1.90
Second quarter	1.6667	120	1.7200	146	1.8100	157	1.75	1.93	.....	2.20
Third quarter	1.6533	119	1.7200	146	1.9100	166	2.05	2.30	1.75	1.90
Fourth quarter	1.9100	138	1.7200	146	1.8100	157	2.05	.....	2.07	1.90
1918:										
First quarter	1.8633	135	1.7400	148	1.8100	157	2.05	2.47	2.27	2.10
Second quarter	1.9800	143	2.1760	184	1.9600	170	2.15	2.47	2.20	2.43
Third quarter	1.8566	134	2.2000	186	2.0500	178	2.29	2.27	2.20	2.45
Fourth quarter	1.7967	130	2.2000	186	2.0500	178	2.30	2.40	2.48	2.48
1919:										
First quarter	.....	.....	2.2000	186	2.05	178	2.30	2.44	2.53	2.77
April	.....	.....	2.0500	174	2.00	174	2.30	.....	2.03	3.00

[a] From price section, War Industries Board.
[b] From private sources.
[c] From the Engineering News-Record.
[d] Figure for June, 1913.

TABLE 56.—*Freight rates on Portland cement.*

[Per 100 pounds.]

From—	To—	1914	1919
Buffington, Ind	Milwaukee, Wis	$0.05	$0.08
La Salle, Ill	do	.05	.085
	Average increase, 65 per cent.		
Buffington, Ind	La Crosse, Wis	.08	.115
La Salle, Ill	do	.08	.11
Hannibal, Mo	do	.08	.13
Mason City, Iowa	do	.05	.10
	Average increase, 57 per cent.		
Mason City, Iowa	Des Moines, Iowa	.063	.085
Hannibal, Mo	do	.10	.115
La Salle, Ill	do	.10	.115
Iola, Kans	do	.125	.135
Buffington, Ind	do	.12	.125
	Average increase, 13 per cent.		
Mason City, Iowa	Sioux City, Iowa	.084	.105
Hannibal, Mo	do	.13	.145
La Salle, Ill	do	.13	.14
Iola, Kans	do	.13	.14
Buffington, Ind	do	.13	.15
	Average increase, 13 per cent.		
Mitchell, Ind	Detroit, Mich	.095	.13
Bellevue, Mich	do	.05	.085
Stroh, Ind	do	.05	.085
Buffington, Ind	do	.08	.11
	Average increase, 49 per cent.		
Mitchell, Ind	Battle Creek, Mich	.09	.125
Stroh, Ind	do	.05	.085
Bellevue, Mich	do	.025	.055
Buffington, Ind	do	.06	.095
Alpena, Mich	do	.08	.115
	Average increase, 56 per cent.		
Mitchell, Ind	Louisville, Ky	.05	.085
	Increase, 70 per cent.		
Mitchell, Ind	Indianapolis, Ind	.06	.085
	Increase, 41 per cent.		
Cementon, N. Y	New York	.09	.11
Howes Cave, N. Y	do	.10	.12
Glenn Falls, N. Y	do	.10	.12
Allentown, Pa	do	.095	.115
Coplay, Pa	do	.095	.115
	Average increase, 23 per cent.		
Mitchell, Ind	Chicago, Ill	.065	.085
Buffington, Ind	do	.03	.05
Oglesby, Ill	do	.045	.065
La Salle, Ill	do	.045	.065
Dixon, Ill	do	.045	.065
Hannibal, Mo	do	.065	.085
	Average increase, 40.7 per cent.		

Source: Interstate Commerce Commission; Portland Cement Association.

SECTION XII. MINERAL AGGREGATE.

Introduction.

If the classification followed in writing this chapter were based solely on the origin of the various products, crushed stone should be more properly treated under the heading of "Quarry Products." However, in this case, it seems more logical, from the point of view of use of the material, to include crushed stone in the same category with sand and gravel.

Relative importance of sand, gravel, and crushed stone.

It has been stated by the United States Geological Survey that only four natural nonmetallic minerals produced in the United States—not including clay products and cement (manufactured products)—show a greater value than sand and gravel; these are petroleum,

natural gas, coal, and stone. The production of sand and gravel in 1917 was valued at more than $35,000,000, which is probably an undervaluation, because it is impossible to get complete returns.

The Geological Survey reports on various kinds of sands and gravels, according to uses, including glass sand, building sand, grinding and polishing sand, fire or furnace sand, engine sand, paving sand, filter sand, other sands, railroad-ballast sand and gravel, and gravel.

In the year 1916, of the total quantity of sand and gravel produced, 47 per cent was building sand, 7 per cent paving sand, and 24 per cent sand and gravel for railroad ballast. In the same year the average price per short ton of all sand and gravel was 33.4 cents; of building sand, 31.5 cents; of paving sand, 35.7 cents; and of railroad ballast sand and gravel, 13.1 cents.

In 1916 crushed stone represented in value 37 per cent of the total output of stone in the country. Of the total quantity of crushed stone produced in that year 10 per cent was granite, 19 per cent basalt and related rocks (trap rock), 67 per cent limestone, and 4 per cent sandstone. In that year the average price per short ton, f. o. b. plant, of crushed stone of all kinds was 61 cents; of crushed granite, 75 cents; of basalt and related rocks (trap rock), 73 cents; of crushed limestone, 55 cents; of crushed sandstone, 77 cents.

Imports and exports of these materials are insignificant. Small amounts are exported to Canada each year, and small amounts are brought into the United States from Canada and from other countries as ballast.

No figures are at hand on chats, chert, or slag, which are used fairly extensively in some localities, but which are considerably less important than sand, gravel, and crushed stone.

Production figures.

Production figures on building sand, gravel, and crushed stone for the years 1913–1918 are given in Table 57. The figures show that production of building sand in 1918 was 2 per cent above the average for the preceding five years. Gravel in 1918 was 34 per cent under the average for the preceding five years. Crushed stone in 1918 was 30 per cent under the average for 1913–1917.

Regional production.

Regional production of crushed stone, as affected by war conditions and as affecting war-time prices, has been considered in Section X of this chapter.

Sand and gravel are so widely distributed and so abundant that any consideration of their regional distribution seems scarcely necessary. The markets are strictly local, and are largely determined by existing schedules of freight rates. The supplies being

plentiful, the quantity produced is usually measured by the effective demand.

During the war the demand for sand and gravel was greatly accentuated in certain localities on and near the Atlantic coast, on account of increased requirements for the construction of cantonments, shipyards, and factories engaged in the manufacture of munitions and other war necessities. In some cases, on account of unprecedented needs, sand and gravel were shipped as far as 300 miles by sea in coal barges. This accounts for the fact that these products, along with certain other basic materials, rose rather more in the eastern part of the United States than elsewhere.

The price record.

Since the prices on the products treated in this section are so largely determined by local conditions, it has been considered advisable to present a considerable number of representative figures.

The first three tables (Tables 58 to 60) give f. o. b. plant prices from various sources. Table 61 gives prices in the following representative markets: New York, Chicago, St. Louis, Cincinnati, Dallas, and San Francisco. These figures are taken from files of the Engineering News-Record.

The figures of the first series of Table 59 indicate that the rise in the eastern part of the country was considerably higher than in other sections.

Some additional figures on prices of crushed stone have been furnished by plants in Kansas and Oklahoma. These prices are f. o. b. plants. The average for 1916 was 85 cents per ton; for 1918, $1.22 per ton; and for the first quarter of 1919, $1.25 per ton. The increase shown by these figures is 47 per cent.

The most representative price figures for the whole country are yearly averages given in Table 57. It is largely from these figures that the composite index for the mineral aggregate group has been computed.

In computing this index, given in the last column of Table 60, the index figures for building sand, gravel, and crushed stone were first computed, the average price for the years 1913–14 being taken as a base, so that the figures would correspond as nearly as possible to the various other sets of figures which use the year preceding July, 1914, as base. These figures have been combined, weighting factors proportional to the average production of each commodity for the years 1913 and 1914 being employed. In computing the quarterly figures for 1917 and 1918 it has been assumed that the fluctuations would be proportional to the fluctuations indicated by the average of all the indices computed by the price section of the War Industries Board.

The final figure, 173, is probably a fairly accurate index of the general price level of this group, based on f. o. b. plant prices throughout the country.

The index for the first quarter of the current year would probably be about 175.

Increased production costs.

Producers of sand, gravel, and crushed stone maintain that their prices have not risen out of proportion to the rise in production costs; that production costs are not likely to decrease; and that their prices are rather more likely to increase somewhat than to decrease.

It is of some interest to present some figures on production costs. Actual production costs and prices have been furnished by certain producers. The figures given below are averages from 28 plants in various localities in the Central States:

Prices and production costs of sand and gravel.

Period.	Average price per ton.	Average production cost per ton.
	Cents.	*Cents.*
1916	45.4	34.5
1918	60.4	58.5
1919 (first quarter)	65.0	58.5
	Per cent.	*Per cent.*
Increase, 1919 over 1916	43	70

These figures would indicate that the 1918 prices were too low to allow for a sufficient profit to the producers. It is impossible to state that these figures indicate the situation of the industry as a whole.

With the cooperation of Mr. E. Guy Sutton, secretary of the National Association of Sand and Gravel Producers, some interesting figures have been obtained from 93 representative producers whose plants are located in all parts of the country.

As a result of averaging the figures obtained from questionnaires sent out, it is possible to present some figures which may be taken as fairly representative of the industry as a whole. According to these figures administrative expenses (including costs of office supplies, rent, postage, salaries of office force, etc.) were 70 per cent greater in 1918 than in 1913; selling expenses (including salaries and expenses of salesmen, etc.) were 58 per cent greater; operating expenses (including labor, salaries of superintendents, drayage, fuel, cost of repairs and supplies, etc.) were 105 per cent greater; replacement costs (including cost of necessary machinery, materials, and labor) in the first quarter of 1919 were estimated to be 114 per cent greater than in 1913.

According to these 93 producers, in normal times the labor cost is 41 per cent of the total production cost; while in 1918 it was 52 per cent of the total. In normal times the cost of fuel is 12 per cent of the total; in 1918 it was 16 per cent.

The figures indicate an average rise in wages of 95 per cent from 1913 to 1918, and an increase of 105 per cent in the cost of fuel.

Of the expenses discussed above, administrative expenses, selling expenses, and replacement costs come under the classification of overhead charges. With an increased volume of business these might become relatively smaller in proportion to the total production cost. The cost of fuel has declined. However, with wages permanently increased, the total cost of production seems likely to remain fairly close to the present figure. If it be true that 1918 prices were too close to the cost of production to permit a reasonable margin of profit, then the contention of the producers that, in general, prices can not be cut in 1919 seems fairly well justified.

The following table gives an itemized statement prepared from actual figures of production costs in 1916 and 1918 in a representative plant:

Cost of production of sand and gravel in a representative plant.

Item.	1916		1918		Increase.
	Ton cost.	Per cent of total.	Ton cost.	Per cent of total.	
					Per cent.
Labor	$0.0756	32.1	$0.163	40.1	107
Stripping	.0235	10.0	.040	9.8	79
Fuel	.0345	10.4	.043	10.5	75
Supplies and repairs	.0347	14.7	.027	6.6	22
Depletion	.0067	2.8	.010	2.7	.....
Depreciation	.0124	5.3	.025	6.1	102
Fixed charges	.0582	24.7	.099	24.2	70
Total	.2356	100.1	.407	100.0	75

Increases in elements of production costs, by regions.

According to the figures furnished by the 93 producers mentioned above, administrative expenses, selling expenses, operating expenses, and replacement costs increased most in the Middle Atlantic States (New York, New Jersey, Pennsylvania).

Operating expenses, however, show the same increase in the Southern States (Virginia, South Carolina, Georgia, Alabama, Kentucky, and Tennessee) as in the Middle Atlantic States. This is accounted for by the fact that the wage increase was greatest in the Southern States, with the Middle Atlantic States coming second.

The Southwestern States (Missouri, Kansas, Oklahoma, Texas, Arkansas, and Louisiana) show the greatest increase in cost of fuel, with the Middle Atlantic States second.

In general, costs, as reported by these producers, increased less in the West than in other sections.

Freight rates on sand, gravel, and crushed stone.

One of the important elements in the increase of cost of sand, gravel, and crushed stone in construction has been the increase in freight rates—the freight being a very large item in the final cost. Since the beginning of the year 1919, the producers, through their organizations, made a determined effort to secure from the Railroad Administration some concessions on the rates.

After careful consideration of the question the Railroad Administration found itself unable to meet the demands of these producers so far as rates to the general public were concerned. A concession was made in the case of such materials for use in the construction of public works by Federal, State, and municipal governments. This concession was made in an order, already referred to in Section VI, providing for a reduction of 10 cents per net ton on sand, gravel, and crushed stone, with a minimum rate of 40 cents per net ton, except in cases where the regular commercial rates are less than that figure, in which cases the regular rates still hold.

As long as there seemed to be grounds for hoping for a general reduction in rates on these materials there seemed to be a promise of a reduction in ultimate prices to the public. At present, except in the case of public projects, there appears to be no chance of a reduction in rates or prices in general.

Tables 62 and 63 give examples of freight rates on sand, gravel, and crushed stone from producing points to various representative markets. These should be considered as illustrations rather than as indications of the general rise in rates for the whole country. The number of rates given is scarcely sufficient to use for anything more than illustration.

Somewhat more representative figures on sand and gravel rates have been furnished by the National Association of Sand and Gravel Producers. These figures are the results of a questionnaire sent out by the association early in March. They cover the increases in rates in effect in March, 1919, over those in effect in March, 1918, the increases having been effected by General Order No. 28 of the Railroad Administration in June, 1918.

An average of 1,951 rates shows an increase of 51 per cent. This is perhaps a fairly representative figure. It is true that over half the rates included in the average were between points in the Central West; but the average for this section is practically the same as for the remainder of the country.

TABLE 57.—*Production figures on sand, gravel, and crushed stone, 1913–1918.*

[Figures from U. S. Geological Survey. Short tons.]

Year.	Building sand.			Gravel.			Crushed stone.		
	Quantity.	Value.	Average price per ton.	Quantity.	Value.	Average price per ton.	Quantity.	Value.	Average price per ton.
1913	25,397,383	$8,007,949	$0.31	40,861,694	$9,109,663	$0.22	48,502,501	$28,592,536	$0.59
1914	24,003,962	7,688,774	.32	41,329,287	9,721,637	.23	49,364,476	30,161,766	.61
1915	22,921,426	6,884,267	.30	40,661,314	9,948,516	.24	49,008,707	29,173,488	.60
1916	27,193,462	8,569,675	.31	46,127,754	12,220,146	.26	48,075,581	29,462,952	.61
1917	25,374,987	9,837,688	.38	35,573,819	13,508,189	.37	40,285,377	29,065,509	.72
1918[a]	25,500,000	11,000,000	.43	27,000,000	12,000,000	.44	33,034,000	32,843,000	.99

[a] Quantities and values for year 1918 estimated.

TABLE 58.—*Prices on sand and gravel.*

[Figures from private sources. Prices per ton f. o. b. plant.]

Place.	Sand.				Gravel.			
	1916 price.	1918 price.	First quarter 1919 price.	Increase, 1919 over 1916.	1916 price.	1918 price.	First quarter 1919 price.	Increase, 1919 over 1916.
				Per cent.				*Per cent.*
Maine (1 series)	$0.45	$0.50	$0.50	11	$1.05	$1.25	$1.25	19
Eastern Massachusetts (average 2 series)	.30	.38	.33	10	.78	1.10	1.05	35
New York City (1 series)	.25	.43	.43	72	.....	.....	.....	.....
Western New York (1 series)	.30	.50	.50	67	.30	.50	.50	67
Western Pennsylvania (average 2 series)	.53	.93	.93	75	.43	.83	.83	93
New Jersey (1 series)	.25	.35	.35	40	.60	1.40	1.20	100
West Virginia (1 series)	.50	.95	.75	50	.50	.95	.75	50
Eastern Maryland (1 series)	.40	.60	.50	25	1.00	1.50	1.30	30
Virginia (1 series)	.50	.60	.50	.....	.90	1.20	.95	5
Ohio (average 2 series)	.42	.55	.65	55	.46	.65	.70	54
Kentucky (1 series)	.50	.85	.85	70	.44	.75	.75	70
Tennessee (average 2 series)	.38	.....	.64	68	.53	.....	.79	49
Indiana (average 19 series)	.39	.46	.46	18	.55	.63	.63	15
Northern Illinois	.30	.40	.40	33	.30	.40	.40	33
Michigan	.40	.68	.68	70	.55	.75	.75	36
Iowa (average 21 series)	.49	.63	.67	37	.49	.63	.67	37
Wisconsin (average 7 series)	.35	.56	.60	71	.35	.56	.60	71
Northern Minnesota (1 series)	.47	.56	.56	19	.47	.56	.56	19
Nebraska (1 series)	.65	.75	.75	15	.65	.75	.75	15
Missouri (average 2 series)	.35	.53	.58	66	.35	.53	.58	66
Kansas (average 2 series)	.30	.50	.58	93	.....	.....	.....	.....
Oklahoma (1 series)	.40	.55	.60	50	.40	.55	.60	50
Central Texas (average 2 series)	.34	.50	.50	47	.44	.62	.71	61
Colorado (1 series)	.45	.55	.55	22	.75	.90	.90	20
Western Washington	.60	.75	.75	25	.60	.75	.75	25
Average	.42	.57	.58	38	.51	.69	.70	37

TABLE 59.—*Sand and gravel prices.*

[Prices f. o. b. plant. Quotations from price section, War Industries Board.]

Commodity	Sand.		Sand, building, core, engine, and glass, grinding.		Sand, building and locomotive.		Sand and gravel, building.		Gravel.	
Market	Eastern United States.		Chicago.		Alton and surrounding district.		Virginia and Ohio.		Erie, Pa.	
Unit	Short ton.		Short ton.		Short ton.		Short ton.		Short ton.	
Period.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.
July 1, 1913, to June 30, 1914	$0.6002	100	$0.1701	100	$0.2925	100	$0.3500	100	$0.6500	100
1913	.5973	99	.1620	95	.2763	94	.3500	100	.6500	100
1914	.5993	100	.1677	98	.2979	102	.3500	100	.6500	100
1915	.6003	100	.1854	109	.3067	105	.3500	100	.6642	102
1916	.6478	108	.1857	109	.3394	116	.3500	100	.7083	109
1917	1.0917	182	.2713	159	.4465	153	.4500	129	.7708	119
1918	1.4796	246	.3227	190	.6388	218	.7500	214	1.0375	160
1917:										
First quarter	.9317	155	.2200	129	.4217	144	.4500	129	.7333	113
Second quarter	1.0360	172	.2466	145	.4094	140	.4500	129	.7500	115
Third quarter	1.1427	190	.3000	176	.4617	158	.4500	129	.7500	115
Fourth quarter	1.2565	209	.3186	187	.4933	169	.4500	129	.8500	131
1918:										
First quarter	1.4540	242	.3280	193	.6367	218	.7500	214	1.0000	154
Second quarter	1.4540	242	.3233	190	.6233	213	.7500	214	1.0000	154
Third quarter	1.4827	246	.3198	188	.6517	223	.7500	214	1.0000	154
Fourth quarter	1.5276	254	.3198	188	.6433	220	.7500	214	1.1500	177

TABLE 60.—*Prices on sand, gravel, and crushed stone.*

[Prices f. o. b. plant. Quotations from price section, War Industries Board.]

Commodity	Sand and gravel railway ballast.		Crushed limestone railway ballast.		Crushed trap rock railway ballast and road metal.		Crushed granite, ¼-inch and ½-inch.		Mineral aggregate.[1]
Market	Ohio.		Pennsylvania.		Pennsylvania.		Chicago, Detroit, and Cleveland.		United States.
Unit	Short ton.		Short ton.		Short ton.		Cubic yard.		
Period.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.	Composite index.
July 1, 1913, to June 30, 1914	$0.1650	100	$0.6800	100	$0.6700	100	$1.2500	100	100
1913	.1650	100	.6800	100	.6475	97	1.2500	100	98
1914	.1650	100	.6800	100	.6633	99	1.2500	100	102
1915	.1650	100	.6800	100	.6083	91	1.2500	100	101
1916	.1650	100	.7325	108	.6683	100	1.2700	102	104
1917	.2000	121	.8167	120	.8275	124	1.3000	104	129
1918	.2250	136	1.0417	153	1.1125	166	1.3000	104	167
1917:									
First quarter	.2000	121	.7500	110	.6833	102	1.3000	104	118
Second quarter	.2000	121	.8167	120	.8100	121	1.3000	104	125
Third quarter	.2000	121	.8500	125	.9167	137	1.3000	104	134
Fourth quarter	.2000	121	.8500	125	.9000	134	1.3000	104	140
1918:									
First quarter	.2250	136	.8500	125	.9667	144	1.3000	104	161
Second quarter	.2250	136	1.0167	149	1.1233	168	1.3000	104	165
Third quarter	.2250	136	1.1500	169	1.1233	168	1.3000	104	168
Fourth quarter	.2250	136	1.1500	169	1.2367	185	1.3000	104	173

[1] Composite figure computed by T. S. Holden from all figures obtainable.

TABLE 61.—*Wholesale market prices on sand, gravel, and crushed stone.*
[Prices per cubic yard in carload lots. Quotations from the Engineering News-Record.]

Market	New York.			Chicago.			St. Louis.		
Date.	Building sand.	Gravel, 1½-inch.	Crushed stone, 1½-inch.	Building sand.[1]	Gravel, 1½-inch.	Crushed stone, 1½-inch.	Building sand.	Gravel, 1½-inch.	Crushed stone, 1½-inch.
April, 1913	$0.50	$0.85	$0.90						
April, 1914	.50	.90	1.00						
April, 1915		.85	.85						
April, 1916	.45	.80	.85	$0.90	$0.90	$0.90	$0.60	$0.70	$1.00
April, 1917	.50	1.20	1.10	1.10	1.40	1.40	.91	.85	1.25
April, 1918	1.25	2.00	1.60	1.50	1.50	1.50	1.21	1.21	1.35
April, 1919	1.25	2.00	1.70	1.10	2.00	1.60	1.68	1.76	1.35

Market	Cincinnati.			Dallas.			San Francisco.		
April, 1916							$0.80	$0.90	$1.25
April, 1917			$0.95	$1.25	$1.00	$1.36	1.00	1.00	1.00
April, 1918	[1] 1.65	[1] 1.65	[1] 1.75	1.40	2.00	1.51	1.00	1.00	1.00
April, 1919	[2] .85	[2] .85		1.35	2.25	2.25	1.15	1.15	1.15

[1] Figure for preceding month. [2] Figure from "Rock products."

TABLE 62.—*Freight rates on sand and gravel.*
[Per 100 pounds.]

From—	To—	Sand.		Gravel.	
		1914	1919	1914	1919
		Cents.	*Cents.*	*Cents.*	*Cents.*
Rhinecliff, N. Y.	New York	7½	10	7½	10
Round Lake, N. Y.	do	14	18	14	18
Van Hoesen, N. Y.	do	10	14½	10	14½
Wemple, N. Y.	do	9	12	9	12
South Amboy, N. J.	do	6	9	6	9
Corsackie, N. Y.	do	8½	11	8½	11
Hempstead, N. Y.	do	6	10	6	10
Marlboro, N. Y.	do	7	9½	7	9½
Mechanicsville, N. Y.	do	12	17	12	17
New Hamburg, N. Y.	do	7	9	7	9
		Per cent.		*Per cent.*	
Average increase		38		38	
Benton Harbor, Mich.	Chicago, Ill.	$0.0125	$0.025	$0.075	$0.03
Elgin, Ill.	do	.015	.025	.015	.025
Michigan City, Ind.	do	.0125	.025	.020	.035
Ottawa, Ill.	do	.025	.035	.025	.035
Rockdale, Ill.	do	.036	.050	.036	.050
		Per cent.		*Per cent.*	
Average increase		58		60	
Crystal City, Mo.	St. Louis, Mo.		$0.035		$0.035
Drake, Mo.	do		.045		.045
East St. Louis, Ill.	do	$0.01	.02	$0.01	.02
Klondyke, Mo.	do	.02	.03		.04
Masselle, Mo.	do		.04		.04
Pacific, Mo.	do		.035		.035
		Per cent.		*Per cent.*	
Average increase		50		50	
Grand Prairie, Tex.	Dallas, Tex.	$0.0145	$0.025	$0.014	$0.025
Lindsay, Tex.	do	.028	.045	.028	.045
Waco, Tex.	do	.028	.045	.028	.045
		Per cent.		*Per cent.*	
Average increase		64		64	
Pleasanton, Calif.	San Francisco, Calif.	$0.065	$0.07	$0.065	$0.07
Antioch, Calif.	do	.02	.03	.02	.03
Campbell, Calif.	do	.02	.03	.02	.03
Niles, Calif.	do	.015	.025	.015	.025
Oakland, Calif.	do	.02	.03	.02	.03
Pacific Grove, Calif.	do	.17	.18	.17	.18
		Per cent.		*Per cent.*	
Average increase		17		17	

Source: Interstate Commerce Commission.

TABLE 63.—*Freight rates on crushed stone.*

[Per net ton.]

From—	To—	1914	1919
Suffern, N. Y.	New York	$1.70	$2.50
Nyack, N. Y.	do	1.10	1.60
Richmond Hill, N. Y.	do	1.00	1.40
New Durham, N. J.	do	1.30	2.00
Menden, Conn.	do	2.40	1.50
Middlefield, Conn.	do	2.40	1.50
Mount Carmel, Conn.	do	2.20	1.50
East Haven, Conn.	do	2.20	1.70
	Average decrease, 4.2 per cent.		
Elmhurst, Ill.	Chicago, Ill.	.76	1.00
Lemont, Ill.	do	.40	.62
	Average increase, 40 per cent.		
Sacramento, Calif.	San California, Calif.	1.90	2.10
Oakland, Calif.	do	.70	.70
	Average increase, 8 per cent.		
Dickerson, Md.	Philadelphia, Pa.	1.00	1.50
Mill Lane, Pa.	do	.60	.90
Norristown, Pa.	do	.55	.90
Glen Wills, Pa.	do	.50	.90
Birdsboro, Pa.	do	.65	1.00
Clingan, Pa.	do	.65	1.00
Rushland, Pa.	do	.60	.90
Pottstown, Pa.	do	.65	2.05
	Average increase, 76 per cent.		

Source: Interstate Commerce Commission.

SECTION XIII. GLASS.

Introduction.

A very valuable source of information on the subject of glass is the pamphlet published by the United States Tariff Commission in 1918 with the title, "The Glass Industry as Affected by the War."

This pamphlet has been used extensively in the preparation of this brief résumé of the subject.

Production of glass sand and glass.

It has been considered advisable to present some figures on glass sand as well as on glass, especially as there are no complete tables of figures on glass production at hand.

The figures in Table 64 on production of glass sand indicate a continued increase in production, even through the year 1918, which is exceptional among the production figures of the building materials group. The reason for this will be shown later to lie in the growth of the export demand during the war, and the development of various kinds of glass which were essential for war purposes. The production figures on glass sand are probably fairly indicative of the growth of the glass industry in the United States during the period covered in the table.

The total production of glass in this country in 1914 was valued at $123,085,019. Taking into account the increase in production of glass sand and the relative increases in prices of both sand and glass during the period 1914–1918, the 1918 production may be very roughly estimated at somewhere in the neighborhood of $350,000,000.

The 1914 production was divided as shown on following page.

Glass production in 1914.

Product.	Square feet.	Value.	Average price per square foot.	Percentage of total value.
Window glass	400,998,893	$17,495,956	[a] $2.18	14.22
Plate glass, polished	60,383,516	14,773,787	.24	12.02
Plate glass, rough	131,492	25,859	.20	.02
Obscured glass	43,040,079	2,417,253	.056	1.96
Wire glass, polished	1,707,848	534,322	.31	.44
Wire glass, rough	13,980,996	1,056,612	.076	.86
All other building glass	.....	520,280	.....	.42
Total building glass	.....	36,824,069	.....	29.94
All other glass	.....	86,260,950	.....	70.06
Total glass	.....	123,085,019	.....	100.00

[a] This price only is figured for 50 square feet; all the others, per square foot.

Further figures have been given on production of plate glass, being estimates made by the Pittsburgh Plate Glass Co., one of the leading producers. These figures are as follows:

Production of plate glass in the United States.

Year.	Square feet.	Year.	Square feet.
1914	60,383,516	1917	75,000,000
1916	66,600,000	1918	49,000,000

The decrease in production in 1918 would be accounted for by the decreased demand occasioned by inactivity in building. The 1918 figure is 19 per cent under the 1914 figure. Early in 1919 it was stated that the plate-glass industry was operating at about 50 per cent of normal capacity.

Early in 1919 it was stated by a prominent glass firm that during the blast of 1917–18 the season's total output of window glass was about 6,300,000 50-foot boxes. This would be a total of 315,000,000 feet, as against 400,998,893 feet for the year 1914, a decrease of 21½ per cent. This firm anticipated that the 1919 production of window glass would be about the same as that of 1918.

It was stated, early in 1919, that the manufacture of illuminating glassware was proceeding at about 60 per cent of capacity.

These figures all show a decrease in production of building glass, although there was an increase in production of glass sand.

The destructive effect of the war on the glass industry of Belgium and France and the shutting off of imports from Germany and Austria made it necessary for the progressive glass manufacturers of America to develop processes for the manufacture of various kinds of glass not produced commercially in this country before the war. During the war absolutely new branches of the glass industry were developed in the United States for the production of the following

articles: Optical goods, laboratory or chemical ware, glass gauge tubing, watch crystals, glazing glass, oven glass, glass brick, siphon bottles, photographic glass, and high-grade picture glass.

Imports and exports of glass.

In addition to the development of the new branches of the glass industry, as referred to in the preceding paragraph, the other outstanding fact in the industry has been the growth of the export business.

Raw materials used in the domestic production of glass are all produced in this country, and consequently do not figure in any consideration of exports and imports.

In 1889 imports of glass of all kinds amounted in value to about 19 per cent, and exports to a little more than 2 per cent of the total domestic production. In 1914 imports for consumption amounted to $8,219,112, or 6.7 per cent of the total domestic production ($123,085,019); and exports amounted to $3,729,623, which was 3 per cent of the total domestic production.

Imports and exports for the years 1914 to 1917 are shown in the following tables:

Glass imports of the United States, 1914 to 1917.[a]

Year.	Window glass.	Plate glass.	Total building glass.	Percentage of building glass to total.	All other.	Total.
				Per cent.		
1914	$1,356,218	$727,889	$2,084,107	25.4	$6,120,696	$8,204,803
1915	722,483	98,171	820,654	17.9	3,771,705	4,592,359
1916	197,549	3,553	201,102	8.9	2,047,899	2,249,001
1917	328,100	13,496	341,596	15.4	1,883,582	2,225,178

[a] From "The Glass Industry as Affected by the War," U. S. Tariff Commission, 1918.

Glass exports of the United States, 1914 to 1917.[a]

Year.	Window glass.	Plate glass.	Total building glass.	Percentage of building glass to total.	All other glass.	Total.
				Per cent.		
1914	$311,339	$35,767	$347,106	9.3	$3,382,517	$3,729,623
1915	1,443,113	831,727	2,274,840	40.8	3,283,877	5,558,717
1916	3,123,911	1,568,181	4,692,092	38.0	7,629,241	12,321,333
1917	3,483,596	2,223,329	5,706,925	42.1	7,847,605	13,554,530

[a] From "The Glass Industry as Affected by the War," U. S. Tariff Commission, 1918.

From these tables it is seen that the 1917 imports had decreased 73 per cent from 1914, while exports increased 263 per cent during the same period. Imports of building glass during this period decreased 83 per cent, while exports in 1917 were 16½ times the 1914 figure.

The prewar glass trade was mainly domestic, and it is only since the war began that the export trade developed into a factor of considerable importance. Belgium was, before the war, the greatest exporter of window and plate glass to this country. France, Germany, and Austria-Hungary were also, in the past, large exporters of glass products. The development of our trade has been largely the result of the cutting off of supplies of glass from these countries.

In a commercial report from Consul General Robert B. Skinner, of London, dated November 25, 1918, it was stated that the supply of glass in England was very low, and that it would be a considerable time before production could return to normal. American glass producers have expected to find extensive markets for their products in the European countries as soon as normal trade and building activities are reestablished in those countries. They have anticipated further development of export business and a maintenance of comparatively high prices on glass as a consequence of the world shortage of this material.

The price record.

Records of prices on glass sand, window glass, and plate glass are given in Tables 65 and 66. The figures on sand are given as representing the principal raw material from which glass is made. The composite indices on window glass are simple averages of the indices of the four price series, and those on plate glass are simple averages of the indices of the two series on that product.

The final indices for the last quarter of 1918 are 272 for glass sand, 169 for plate glass, and 307 for window glass. If the figures for plate glass and window glass be combined, according to their relative importance, a composite index of 244 is obtained, which might be said to indicate the price level of building glass for the last quarter of 1918.

The April figures show a rise of 9½ per cent on plate glass over the last quarter of 1918 and a decline of 13.3 per cent on window glass prices; the April indices being 185 and 266, respectively.

A composite building-glass index for April would be 229, which is 6 per cent less than the figure for the last quarter of 1918.

Cost of production.

In addition to the two factors described above which have made for rises in prices of building glass, there was a third, of equal if not greater importance, the increase in cost of production.

The price figures on glass sand give an indication of the rise in costs of raw materials. This material constitutes about 52 per cent of the total raw materials used.

One item of increased expense was that of the fire clay used in making tank furnace blocks or pots in which the glass is melted.

Formerly a very high grade of clay was imported from Germany for this purpose. After this supply was cut off domestic clay had to be substituted. An important manufacturer stated that the pots and blocks made from the domestic fire clay do not last so long as those made from the imported clay, which results in a great increase in the cost of replacement and also in the cost of production.

Comparative figures on wages in three branches of building-glass production are shown in the following tables, taken from the Tariff Commission's pamphlet:

Comparative figures on wages in three branches of building-glass production.

WINDOW GLASS, HAND AND MACHINE.

Occupation.	Average earnings per week.		Per cent of increase 1914–1917.
	1914	1917	
Blowers, machine	$25.00	$40.00	60.0
Blowers, hand	34.74	50.13	44.3
Gatherers	27.83	39.65	42.4
Flatteners	42.17	53.81	27.6
Machine tenders	13.50	20.00	48.2
Furnace chargers	15.64	21.10	34.9
Batch mixers, machine	13.30	21.60	62.4
Batch mixers, hand	13.03	17.95	37.7
Common laborers, machine	10.23	19.80	93.5
Common laborers, hand	11.11	15.75	41.7
Average increase			49.3

PLATE GLASS—AVERAGE EARNINGS PER HOUR, 1914–1917.

Occupation.	Average earnings per hour (cents).		Per cent of increase, 1914–1917.
	1914	1917	
Casting department	23.5	34.5	46.8
Grinding department	20.0	30.5	52.5
Polishing department	16.0	27.5	71.9
Pot-making department	20.5	33.5	63.4
Yard labor	15.5	27.5	77.4
Average increase			62.4

WIRE, OBSCURED, AND ROUGH-ROLLED GLASS.

Occupation.	Average earnings per hour (cents).		Per cent of increase, 1914–1917.
	1914	1917	
Machine tenders	24.2	37.0	52.7
Furnace chargers	23.7	35.5	49.7
Batch mixers	20.4	29.8	46.1
Ladlers	26.5	37.5	41.5
Cutters	37.0	47.0	27.0
Common laborers	18.2	30.3	66.3
Average increase			47.2

The average of all these increses is 51.8 per cent. These figures, it should be noted, show the increase to 1917 only.

Some further figures on increases in production costs have been furnished to this division by two important manufacturers of plate glass. These figures are as follows:

Element of cost.	Increase, 1918 over 1913.	
	First manufacturer.	Second manufacturer.
	Per cent.	*Per cent.*
Labor	72	90
Raw materials	71	125
Fuel	141	51
Transportation	39	(a)
Other elements	81	270
Total production cost	80	109

a Not available.

The first manufacturer also stated that during the years 1914 to 1918, inclusive, long freight hauls were eliminated where possible and careful attention was given to material stocks, with the result that the increase in manufacturing cost was not parallel with the increases in prices of raw materials, wages, and rates.

No figures are available on production costs in the window glass industry for 1918.

Early in 1919 a leading manufacturer in the illuminating glassware business stated the prices of his product were not unduly high, considering production costs, and were not due to drop. High production costs were attributed partly to increased wages, but in greater part to increased cost of materials which, it was stated, ran from 100 to 300 per cent above 1914 prices.

TABLE 64.—*Quantity and value of glass sand produced in the United States, 1909–1919.*

[Figures from U. S. Geological Survey.]

Years.	Quantity.	Value.	Average price per ton.	Relative price.a
	Short tons.			
Average 1908–1912	1,332,539	$1,357,778	$1.02	100
1913	1,791,800	1,895,991	1.06	104
1914	1,619,649	1,568,030	.97	95
1915	1,884,044	1,606,640	.85	83
1916	2,018,317	1,957,797	.97	95
1917	1,942,675	2,685,014	1.38	135
Average 1913–1917	1,851,297	1,942,694	1.05	.....
1918b	2,300,000	4,200,000	1.83	180

a Base: Average prices 1913 and 1914, $1.02—100.
b 1918 figures roughly estimated by Division of Public Works and Construction Development.

TABLE 65.—*Wholesale prices on glass sand and window glass.*

[Quotations from price section, War Industries Board.]

Commodity	Glass sand.		Window glass.	
			Single, United, inches 40–A.	
Market	Maryland.		New York.	
Period.	Price per short ton.	Relative price.	Price per 50 square feet.	Relative price.
July 1, 1913, to June 30, 1914	$1.2250	100	$2.5500	100
1913	1.2500	102	2.5500	100
1914	1.2000	98	2.5500	100
1915	1.2000	98	2.8050	110
1916	1.2583	103	3.4650	136
1917	1.9333	158	4.5353	178
1918	3.1875	260	6.7903	266
1917:				
First quarter	1.5000	122	3.9600	155
Second quarter	1.8167	148	4.1800	164
Third quarter	2.0000	163	4.6200	181
Fourth quarter	2.4167	197	5.3812	211
1918:				
First quarter	2.9167	238	6.0412	237
Second quarter	3.0833	252	6.6000	259
Third quarter	3.4167	278	6.9300	272
Fourth quarter	3.3333	272	7.5900	298
19:				
First quarter			7.5900	298
April			6.6000	259

Commodity	Window glass.					
	Double, United, inches 40–A.		Single, United, inches 40–B.		Double, United, inches 40–B.	
Market	New York.		New York.		New York.	
Period.	Price per 50 square feet.	Relative price.	Price per 50 square feet.	Relative price.	Price per 50square feet.	Relative price.
July 1, 1913, to June 30, 1914	$3.6400	100	$1.9550	100	$3.3200	100
1913	3.6400	100	1.9550	100	3.3200	100
1914	3.6400	100	1.9550	100	3.3200	100
1915	3.8800	107	2.6350	135	3.5600	107
1916	5.9125	162	2.7125	139	4.7288	142
1917	7.5588	208	3.6167	185	5.9473	179
1918	10.9505	301	6.1204	313	8.4423	254
1917:						
First quarter	6.6000	182	3.1000	158	5.3350	161
Second quarter	6.9667	192	3.3067	169	5.5533	168
Third quarter	7.7[illegible]	212	3.7200	190	5.9898	181
Fourth quarter	8.9687	246	4.3400	222	6.9113	208
1918:						
First quarter	10.0687	276	4.9042	251	7.7374	233
Second quarter	11.0000	302	5.9375	304	8.4681	255
Third quarter	11.1833	307	6.5100	334	8.6249	260
Fourth quarter	11.5500	317	7.1300	364	8.9386	269
1919:						
First quarter	10.1800	279	7.1300	364	8.2000	247
April	9.3200	253	6.2000	317	7.7700	234

NOTE.—Figures for 1919 from Oil, Paint, and Drug Reporter.

TABLE 66.—*Wholesale market prices on glass.*

[Quotations from price section, War Industries Board.]

Commodity	Plate glass.				Composite indices.	
	Polished glazing area, 5–10 square feet.		Polished glazing area, 3–5 square feet.		Plate glass.	Window glass.
Market	New York.		New York.		New York.	New York.
Period.	Price per square foot.	Relative price.	Price per square foot.	Relative price.	Average of 2 series.	Average of 4 series.
July 1, 1913, to June 30, 1914	$0.3008	100	$0.2208	100	100	100
1913	.3183	106	.2367	107	107	100
1914	.2908	97	.2108	95	96	100
1915	.2533	84	.1867	85	85	100
1916	.3375	112	.2917	132	122	147
1917	.3925	130	.3400	154	142	189
1918	.4525	150	.3608	163	157	282
1917:						
First quarter	.3800	126	.3400	154	140	166
Second quarter	.3800	126	.3400	154	140	174
Third quarter	.4000	133	.3400	154	143	192
Fourth quarter	.4100	136	.3400	154	145	233
1918:						
First quarter	.4200	140	.3400	154	147	251
Second quarter	.4300	143	.3467	157	150	279
Third quarter	.4667	155	.3700	168	161	290
Fourth quarter	.4933	164	.3867	175	169	307
1919:[a]						
First quarter	.5233	174	.4100	186	180	297
April	.5400	179	.4200	190	185	266

[a] Figures for 1919 from Oil, Paint, and Drug Reporter.

SECTION XIV. PAINT MATERIALS.

Introduction.

Paint materials are so closely allied to drugs and chemicals, and so many of these materials are imported that any comprehensive study of them would go beyond the scope of this report. The yearbooks of the Oil, Paint, and Drug Reporter contain much information that is valuable on this subject.

Production figures.

From the figures on linseed oil (Table 67) it is seen that the gross supply in 1917 was 13½ per cent under 1916. In 1918 the gross supply was 12½ per cent under 1917.

Turpentine for the year ending April 1, 1918, was 11½ per cent below the production for the previous year. (See Table 68.) For the year ending April 1, 1919, the estimated figure is 36½ per cent less than for the preceding year.

There are not at hand figures on production of white lead or zinc oxide. Figures on lead and zinc are therefore given in their places (Table 69).

The total supply of lead in 1918 was nearly 10 per cent under the figure for the year 1917. Zinc in 1918 was about 16½ per cent under the 1917 figure. Lead and zinc compounds available for use as paint materials probably declined even more than this, since other compounds were much in demand for war uses.

Review of paint and varnish business during the war.

In addition to the conditions of lessened demand due to inactivity in building, paints and varnishes were subject to the uncertainties of import trade and to the restrictions on this trade imposed by the War Trade Board. Many of the varnish materials were in great demand for war purposes. Many paint pigments suffered considerable reductions in production, due to the demands for allied chemical products.

The following is quoted from the Oil, Paint, and Drug Reporter 1918 Yearbook as summarizing the conditions in the paint industry during 1918:

Every branch of the paint industry during the year 1918 was affected by the same general conditions. In many different branches there were peculiar conditions, but this does not alter the truth of the statement that general conditions affected all branches of the industry in very much the same manner. In the first place, there was to be considered a greatly increased cost of production, due in part to the higher cost of labor and in part to the higher cost of raw materials. In some instances the higher cost of raw materials was the result of the higher labor cost, and in some cases a result of the shutting off of foreign supplies. High costs from any reason results in decreased consumption; but under war conditions the decrease in consumption incident to high values was not nearly as important a matter as the decrease in consumption which the Government found it necessary to arbitrarily command in order that men and material might be available for the war uses of the Government.

The restrictions upon general building operations were such as to make the general domestic demand almost nil. The orders that came in from the Government for actual war work were what served to keep the trade going during most of the year. When hostilities finally ceased—at a time when the Government consumption was at its highest point—the paint industry was largely working for the Government. It was Government demand that made it possible for the industry to continue in business at a time when war conditions were affecting the industry in every direct and indirect manner conceivable.

The Government needed lead. This fact forced an advance of lead pigments. The Government needed acids used in the manufacture of certain dry colors. Therefore, acids only became obtainable to color makers, if at all, at unusual prices. So it was with other materials. To offset this the Government was a very heavy consumer of almost everything the trade produced, and it was willing to pay the prices which were forced by the situation.

There was no opportunity for the consumption of much paint and paint materials in new private construction work, because this work was practically confined, by Government regulations, to essential war construction. The high cost of material made it inadvisable for repainting to be done, and the whole industry—when the fighting ceased—was doing its bit by delivering as promptly as possible on Government orders and neglecting general business.

When the armistice came there was no industry which more quickly recognized that the period of a return to normality must be a long one. There was no attempt

made to force conditions which permitted of no forcing. There was no sudden let-up in Government orders for this sort of goods, as there was in some used for more warlike purposes. There was a decrease in Government consumption from the day the fighting ceased, but the decrease was a fairly gradual one. The fact that the Government's ambitious shipbuilding plans were to be carried out, at least to a very large extent, made the Government continue to be a heavy consumer of many sorts of paints and paint materials.

In most lines there was no canceling of contracts previously placed. At the same time there was no immediate improvement in the general domestic demand—nor was such a thing expected. Most consumers looked for lower prices as a result of the end of the war, and were therefore inclined to withhold orders waiting for the price readjustment they so confidently anticipated. This position was a natural and logical one, and yet conditions were all against sudden price changes. The result was that the closing weeks of the year saw a very dull market.

The war was over, the restrictions were being rapidly withdrawn, the outlook for an active domestic and export business was good, and yet it was not a time to attempt to force matters, more especially not a time to invite demoralization by sudden radical changes based upon future possibilities. The end of hostilities was followed by a decline in the price of pig lead and some other basic raw materials in the paint industry, but there was no reduction in the cost of labor—a most important matter in all lines—and none was looked for.

The producer, the middleman, and the retailer have been waiting since the close of the active warfare in Europe for the ultimate consumer to begin to express his needs in orders. The ultimate consumer has beeen waiting for a price readjustment to meet his views of the situation. There has been no possibility of any action that would force the situation, but the fact that there was, as a rule, no accumulation of stocks in any hands was a very strong feature of the situation. The producer was not stocked up. He had been working for the Government to a great extent, and the Government did not refuse delivery on its orders as a rule. The middleman had no incentive to accumulate stocks. The retailer, if he was at all a merchant, had a chance to sell his stocks clean at good profits, so that when the demand starts it will be reflected with wonderful promptness from the consumer to the producer or importer of the basic raw materials of the trade.

A review of the prices of the years means little as a basis of comparison of normal values because general conditions have governed the entire market. These conditions were of so unusual a nature that they will never be known again, and in each separate item of the trade there have been peculiar conditions, now forever things of the past.

The price record.

The price record of paint and varnish materials is shown in Tables 70 to 76.

It is interesting to note that, up to the last quarter of 1918, basic lead carbonate, dry, had increased 87 per cent; linseed oil, 228 per cent; and white lead in oil, 106 per cent.

Similarly, it is noted for the same period that whiting advanced 178 per cent; linseeed oil, 228 per cent; and putty, 309 per cent.

Two series of figures are given on turpentine, one for the New York market and one for the Savannah market. The difference in prices between the two markets is probably due entirely to the transportation charges. In the New York market turpentine is seen

to have advanced 61 per cent up to the last quarter of 1918, while the advance was only 51 per cent in the Savannah market.

The composite index figures shown in the last column of Table 76 are weighted averages computed by the price section of the War Industries Board, as representing the general rise for the entire group of paints and varnishes.

The 1918 price record for linseed oil is very clearly set forth in the following statement taken from the 1918 Yearbook of the Oil, Paint, and Drug Reporter:

As a period of high prices, the year 1918 will be long remembered in the linseed oil trade. Quotations advanced steadily each month from the start of the year until the peak of the rise had been reached in August and prevailed until well along in September. Shutting off imports of linseed from the Argentine by the Government in its desire to conserve shipping space for troop and supply movements to Europe, was the principal factor in bringing about the record price condition. While it was true that all imports of the seed had not been absolutely cut off, cargoes being allowed to be brought in if proper licenses had been procured, it was true that no licenses were obtainable unless the prospective licensee could show that he had obtained actual shipping space for bringing in of the cargo. The finding of shipping space was so difficult a matter as to make the movement of the seed from the South American country almost negligible so far as keeping abreast of actual requirements was concerned. Steamships were entirely out of the question and as a result the movement to this country was made wholly and solely by means of sailing vessels. These were of rather limited cargo capacity at best.

Up to the close of hostilities the needs of the Government were so great that the amount of oil available for the general trade was very limited, and there was no exportation of oil permitted. The end of hostilities found crushers with very small stocks of either seed or oil on hand, and there was not much oil in the hands of middlemen.

The quantities of linseed received from Argentina were about sufficient to supply the current needs of the oil crushing mills in the Eastern States, while the seed from Canada and the Northwest had taken care of the immediate demands of the Western crushers. The receipt of linseed from the North Dakota fields was delayed by early snows which buried the flax. In some sections indications were that the snow might prevent the threshing of linseed until the spring of 1919.

The beginning of the year saw the car-lot price at $1.28 a gallon. This was the low price of the year. By the middle of March the price had advanced to $1.55 a gallon. This price was the highest ever known in the history of the trade; but it did not remain a record price very long. By the end of June the price had advanced to $1.60. The end of July saw it $1.84, and early in August it went to the extreme price of $1.90—holding at that level until the middle of September.

An order forbidding imports created much consternation in the trade. The protests that followed resulted in a close investigation by the authorities in Washington into the whole industry. The crushers turned over to the Government a complete statement giving all the inside facts of their business, and the showing made the shortage of oil so apparent that there never was a time when licenses to import could not be obtained.

The linseed requirements of this country for the 1918–19 fiscal period were given as 26,000,000 bushels in the report of the linseed oil committee of the National Paint, Oil and Varnish Association at the convention of this organization in Boston, December 2–4, 1918. Of the required amount, 16,000,000 bushels were expected from the American Northwest, but the official estimate of the linseed crop in the United

States was 14,657,000 bushels. More than 11,000,000 bushels, therefore, must be obtained from Canada, India, and Argentina. A government order for 500,000 bushels from India was announced.

In view of an estimated export surplus of 800,000 tons or 34,000,000 bushels of linseed from the 1918–19 crop, Argentina faced a declining market with the signing of the armistice. This had been preceded by wild fluctuations in October, due to rumors of coming peace, and assurances of a bumper crop.

When the price of oil went to $1.90 a gallon in the United States demand was stopped, except for oil that had to be had at any price. It was impossible to bring down the price at once in the way that consumers seemed to expect. The result was that in the latter part of the year trade was very slow. Early in October there was a price of $1.60, and one day that was cut to $1.50. There was considerable business done at this level. The price was then jumped back to $1.60. The end of the year found it was $1.55, or about where it was early in April.

Eastern crushers were forced to store the cake and meal they would have found an active foreign market for under normal conditions. The end of the year found stocks of oil in all hands small, few contracts for future delivery on the books of the producers, and the trade still buying only what the day-to-day necessities of the business forced them to purchase on the spot.

TABLE 67.—*Production figures on linseed oil in the United States.*

[Unit: Gallon. Figures from War Industries Board.]

	1913	1914	1915	1916	1917	1918[a]
Domestic production	60,083,000	58,095,000	71,816,000	66,371,000	57,224,000	50,060,133
Imports	162,000	580,000	88,000	104,000	84,000	26,133
Gross supply	60,245,000	58,675,000	71,904,000	66,475,000	57,308,000	50,086,266
Exports	2,299,000	266,000	1,497,000	884,000	1,539,000	774,133
Net supply	57,946,000	58,409,000	70,407,000	65,651,000	55,769,000	49,312,133

[a] Figures for 1918 from Bureau of Markets.

TABLE 68.—*Production figures on turpentine in the United States.*

[Figures from Naval Stores Review and Journal of Trade, April 6, 1919.]

Year ended April 1—	Number of 50-gallon casks.	Year ended April 1—	Number of 50-gallon casks.
1913	680,000	1917	535,000
1914	610,000	1918	473,551
1915	512,000	1919	[a] 299,688
1916	470,000		

[a] Estimated.

TABLE 69.—*Production figures on lead and zinc, 1914–1918.*

[Quantities in short tons. Figures from Oil, Paint, and Drug Reporter 1918 Yearbook.]

Year.	Lead.			Zinc.		
	Domestic production.[a]	Imports.[b]	Total supply.	Domestic production.[c]	Imports.[d]	Total supply.
1914	522,864	28,338	551,202	406,959	12,132	419,191
1915	601,417	51,496	652,913	586,491	57,669	644,160
1916	622,967	35,330	658,297	702,610	148,147	850,757
1917	651,156	78,272	729,428	711,192	72,474	783,666
1918	563,000	95,940	658,940	627,000	24,200	651,200

[a] Lead content of ore mined in the United States.
[b] Lead content of ore, bullion, and refined lead imported into the United States.
[c] Recoverable zinc content of ore mined in the United States.
[d] Zinc content of ore imported into the United States.

TABLE 70.—*Wholesale market prices on paint pigments, dry colors.*

[Quotations from price section, War Industries Board.]

Commodity	Bone black.		Chrome green.		Chrome yellow.		Ocher.		Paris green.	
Market	New York.		New York.		New York.		New York.		New York.	
Period.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per ton.	Relative price.	Price per pound.	Relative price.
July 1, 1913, to June 30, 1914.	$0.0225	100	$0.1700	100	$0.1100	100	$12.0000	100	$0.1167	100
1913	.0225	100	.1700	100	.1100	100	12.0000	100	.1242	107
1914	.0225	100	.1825	107	.1090	99	12.1000	100	.1133	97
1915	.0225	100	.2375	140	.1190	108	13.0000	108	.1263	108
1916	.0369	164	.4875	286	.2875	261	18.8333	157	.2700	162
1917	.0400	178	.3400	200	.2413	219	21.3333	178	.3900	335
1918	.0475	211	.3950	232	.2742	249	30.0000	250	.4133	359
1917:										
First quarter	.0400	178	.4000	236	.2500	227	20.0000	167	.2600	223
Second quarter	.0400	178	.3200	188	.2367	215	20.0000	167	.4200	360
Third quarter	.0400	178	.3200	188	.2400	218	21.3333	178	.5000	429
Fourth quarter	.0400	178	.3200	188	.2383	217	24.0000	200	.3800	326
1918:										
First quarter	.0400	178	.3333	196	.2333	212	30.0000	250	.4233	363
Second quarter	.0400	178	.3667	216	.2633	239	30.0000	250	.4300	369
Third quarter	.0550	244	.4500	265	.3000	273	30.0000	250	.4200	360
Fourth quarter	.0550	244	.4300	253	.3000	273	30.0000	250	.4000	343
1919:[a]										
First quarter	.0550	244	.3766	221	.2800	254	30.0000	250	.3900	334
April	.0550	244	.3500	205	.2500	227	30.0000	250	.3700	317

[a] Figures for 1919 from Oil, Paint, and Drug Reporter.

TABLE 71.—*Wholesale market prices on paint pigments, dry colors.*

[Quotations from price section, War Industries Board.]

Commodity	Prussian blue.		Lampblack.		Ultramarine.		Umber.		Venetian red.	
Market	New York.		New York.		New York.		New York.		New York.	
Period.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.
July 1, 1913, to June 30, 1914.	$0.2933	100	$0.0300	100	$0.0383	100	$0.0200	100	$0.0075	100
1913	.3000	100	.0300	100	.0400	105	.0200	100	.0075	100
1914	.3175	101	.0300	100	.0358	94	.0200	100	.0075	100
1915	.8292	274	.0363	121	.0388	101	.0200	100	.0075	100
1916	1.6917	566	.1163	388	.1075	281	.0202	101	.0190	253
1917	1.3375	447	.1317	439	.2133	557	.0296	148	.0244	325
1918	1.1300	378	.1375	458	.1550	405	.0350	175	.0250	333
1917:										
First quarter	1.5000	502	.1200	400	.2000	522	.0225	112	.0200	267
Second quarter	1.5000	502	.1400	467	.2333	609	.0275	138	.0275	367
Third quarter	1.5000	502	.1400	467	.2500	653	.0317	158	.0275	367
Fourth quarter	.8500	284	.1267	422	.1700	444	.0367	184	.0225	300
1918:										
First quarter	.9100	304	.1200	400	.1700	444	.0350	175	.0250	333
Second quarter	.9900	331	.1300	433	.1700	444	.0350	175	.0250	333
Third quarter	1.3500	451	.1500	500	.1400	366	.0350	175	.0250	333
Fourth quarter	1.2700	424	.1500	500	.1400	366	.0350	175	.0250	333
1919:[a]										
First quarter	.9300	315	.1500	500	.1266	330	.0350	175	.0250	333
April	.8000	272	.1500	500	.0800	209	.0350	175	.0250	333

[a] Figures for 1919 from Oil, Paint, and Drug Reporter.

TABLE 72.—*Wholesale prices on paints and pigments.*

[Quotations from price section, War Industries Board.]

Commodity	Outside white paint.		Basic lead sulphate.		Red lead.		Litharge.		Lithopone.	
Market	New York.		New York.		New York.		New York.		New York.	
Period.	Price per gallon.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.
July 1, 1913, to June 30, 1914	$1.4200	100	$0.0510	100	$0.0629	100	$0.0594	100	$0.0375	100
1913	1.4200	100	.0523	103	.0654	104	.0644	108	.0375	100
1914	1.4200	100	.0496	97	.0588	93	.0540	91	.0375	100
1915	1.4200	100	.0540	106	.0635	101	.0581	98	.0508	135
1916	1.8967	134	.0817	160	.0925	147	.0875	147	.1094	292
1917	2.5500	180	.0940	184	.1117	178	.1063	179	.0623	166
1918	3.3000	232	.0894	175	.1060	169	.1010	170	.0733	195
1917:										
First quarter	2.2500	158	.0833	163	.1000	159	.0933	157	.0608	162
Second quarter	2.4500	173	.0942	185	.1133	180	.1083	182	.0625	167
Third quarter	2.7500	194	.1100	216	.1300	207	.1250	210	.0642	171
Fourth quarter	2.7500	194	.0883	173	.1033	164	.0983	165	.0617	167
1918:										
First quarter	2.7500	194	.0875	172	.1000	159	.0950	160	.0650	173
Second quarter	3.2500	229	.0858	168	.1008	160	.0958	161	.0717	191
Third quarter	3.6000	254	.0917	180	.1108	176	.1058	178	.0767	205
Fourth quarter	3.6000	254	.0925	181	.1125	179	.1075	181	.0800	213
1919:										
First quarter	.....	.....	.0857	168	.1058	168	.1008	170	.0736	196
April	.....	.....	.0825	162	.1025	163	.0975	164	.0650	173

TABLE 73.—*Wholesale market prices on paint materials.*

[Quotations from price section, War Industries Board.]

Commodity	Basic lead carbonate, dry.		White lead in oil.		Zinc oxide, French process.		Zinc oxide, standard.		Barytes, domestic floated.	
Market	New York.		New Yrok.		New York.		New York.		New York.	
Period.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per ton.	Relative price.
July 1, 1913, to June 30, 1914	$0.0533	100	$0.0681	100	$0.0667	100	$0.0538	100	$17.0000	100
1913	.0533	100	.0675	99	.0692	104	.0538	100	16.8333	99
1914	.0521	98	.0675	99	.0658	99	.0538	100	17.0000	100
1915	.0569	107	.0698	102	.1612	242	.0667	124	16.4792	97
1916	.0829	150	.0927	136	.1746	262	.0919	171	25.1667	148
1917	.0992	186	.1121	165	.1550	232	.1004	187	27.7500	163
1918	.0956	179	.1268	186	.1292	194	.0997	185	31.0833	183
1917:										
First quarter	.0892	167	.0992	146	.1750	262	.0975	181	25.0000	147
Second quarter	.0992	186	.1108	163	.1583	238	.0992	184	28.0000	165
Third quarter	.1150	216	.1275	187	.1500	225	.1025	191	28.0000	165
Fourth quarter	.0983	175	.1198	163	.1367	205	.1025	191	30.0000	177
1918:										
First quarter	.0933	175	.1075	158	.1267	190	.1000	186	28.0000	165
Second quarter	.0908	170	.1210	178	.1300	195	.1000	186	30.6667	180
Third quarter	.0983	185	.1386	204	.1300	195	.1000	186	32.6667	192
Fourth quarter	.1000	187	.1400	206	.1300	195	.0990	184	33.0000	194
1919: [a]										
First quarter	.0967	181	.1367	200	.1283	192	.0950	177	33.0000	194
April	.0900	169	.1300	191	.1150	172	.0950	177	30.5000	179

[a] Prices, 1919, from Oil, Paint, and Drug Reporter.

TABLE 74.—*Wholesale market prices on paint materials.*

[Quotations from price section, War Industries Board.]

Commodity	Turpentine.		Turpentine.		Whiting.		Putty.		Blanc fixe, pulp.	
Market	New York.		Savannah.		New York.		New York.		New York.	
Period.	Price per gallon.	Relative price.	Price per gallon.	Relative price.	Price per cwt.	Relative price.	Price per pound.	Relative price.	Price per ton.	Relative price.
July 1, 1913, to June 30, 1914	$0.4500	100	$0.4165	100	$0.4500	100	$0.0115	100	$40.0000	100
1913	.4279	95	.3931	94	.4500	100	.0115	100	40.0000	100
1914	.4733	105	.4477	107	.4500	100	.0115	100	40.0000	100
1915	.4594	102	.4281	103	.4708	105	.0115	100	42.5000	106
1916	.4910	109	.4544	109	.7000	155	.0325	283	97.0833	243
1917	.4877	108	.4475	107	1.0667	237	.0400	348	35.4167	89
1918	.5931	132	.5138	123	1.2375	275	.0466	405	35.0000	88
1917:										
First quarter	.5342	119	.5033	121	.9500	211	.0330	287	36.6667	92
Second quarter	.4850	108	.4325	104	.9500	211	.0370	322	35.0000	88
Third quarter	.4233	94	.3808	91	1.0500	233	.0450	391	35.0000	88
Fourth quarter	.5080	113	.4733	114	1.3167	292	.0450	391	35.0000	88
1918:										
First quarter	.4692	104	.4242	102	1.2000	267	.0450	391	35.0000	88
Second quarter	.5156	115	.4108	99	1.2500	278	.0450	391	35.0000	88
Third quarter	.6640	148	.5917	142	1.2500	278	.0495	430	35.0000	88
Fourth quarter	.7237	161	.6283	151	1.2500	278	.0470	409	35.0000	88
1919:[1]										
First quarter	.7133	159	.6790	163	1.2500	278	.0470	409	35.0000	88
April	.7500	167	.....	.....	1.2500	278	.0465	404	35.0000	88

[1] Figures for 1919 from Oil, Paint, and Drug Reporter.

TABLE 75.—*Wholesale prices on varnish raw materials.*

[Quotations from price section, War Industries Board.]

Commodity	Copal gum, manila.		Kauri gum, ordinary chips.		Shellac, T. N.		Carnauba wax.		Casein.	
Market	New York.		New York.		New York.		New York.		New York.	
Period.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.
July 1, 1913, to June 30, 1914	$0.0725	100	$0.1363	100	$0.1913	100	$0.4463	100	$0.0750	100
1913	.0700	97	.1300	95	.2008	105	.4567	102	.0750	100
1914	.0842	116	.1571	115	.1592	83	.4542	101	.0478	64
1915	.0917	126	.1575	116	.1488	78	.3550	79	.0891	119
1916	.0915	126	.1321	97	.2717	143	.3717	83	.1925	257
1917	.0973	134	.1317	96	.5258	275	.4642	104	.1983	264
1918	.1383	191	.2008	147	.6317	330	.7875	176	.1754	234
1917:										
First quarter	.0792	109	.1300	95	.4400	230	.4133	92	.1667	222
Second quarter	.0900	124	.1300	95	.5767	301	.4500	101	.1900	253
Third quarter	.1000	138	.1300	95	.5733	299	.4700	105	.2200	293
Fourth quarter	.1200	166	.1367	100	.5133	268	.5233	117	.2167	289
1918:										
First quarter	.1200	166	.1800	132	.5867	306	.6000	134	.1800	240
Second quarter	.1233	170	.1800	132	.6267	328	.8467	190	.1567	209
Third quarter	.1500	207	.2133	156	.6600	345	.8667	194	.1650	220
Fourth quarter	.1600	221	.2300	169	.6533	341	.8367	187	.2000	267
1919:[1]										
First quarter	.1466	202	.2300	169	.5300	277	.7466	167	.1933	257
April	.1400	193	.2300	169	.4600	240	.7200	161	.1800	240

[1] Figures for 1919 from Oil, Paint, and Drug Reporter.

TABLE 76.—*Wholesale market prices on paint and varnish materials.*

[Quotation from price section, War Industries Board.]

Commodity	Inside oil varnish.		Linseed oil.		Soya bean oil.		China wood oil.		Paints and varnishes.
Market	New York.		New York.		F. o. b. mill.		New York.		
Period.	Price per gallon.	Relative price.	Price per gallon.	Relative price.	Price per pound.	Relative price.	Price per pound.	Relative price.	Composite index.[1]
July 1, 1913, to June 30, 1914	$1.6250	100	$0.4863	100	$0.0637	100	$0.0693	100	100
1913	1.6250	100	.4621	95	.0612	96	.0728	105	100
1914	1.6250	100	.5017	103	.0630	99	.0701	101	100
1915	1.6250	100	.5617	116	.0625	98	.0674	97	109
1916	1.6250	100	.7508	154	.0891	140	.1154	167	144
1917	1.7500	108	1.1067	228	.1421	223	.1677	242	173
1918	2.4417	150	1.5920	327	.1828	287	.2542	367	214
1917:									
First quarter	1.7500	108	.9333	192	.1233	194	.1292	186	159
Second quarter	1.7500	108	1.1533	237	.1433	225	.1483	214	173
Third quarter	1.7500	108	1.1767	242	.1379	217	.1767	255	183
Fourth quarter	1.7500	108	1.1633	239	.1638	257	.2167	313	178
1918:									
First quarter	2.0000	123	1.3731	282	.1821	286	.2000	289	186
Second quarter	2.5000	154	1.5650	322	.1908	299	.2500	361	212
Third quarter	2.5667	158	1.8371	378	.1808	284	.2867	414	230
Fourth quarter	2.7000	166	1.5928	328	.1775	279	.2800	404	230
1919:[2]									
First quarter			1.4833	305	.1400	220	.2333	337	215
April			1.5000	308	.1450	228	.1850	271	202

[1] Index figure computed by price section, War Industries Board.
[2] Prices for 1919 from Oil, Paint, and Drug Reporter.

SECTION XV. MISCELLANEOUS BUILDING MATERIALS.

Introduction.

The principal basic building materials have been covered in the preceding sections of this study. There is at hand, however, a certain amount of material on commodities which are not really classifiable in any of the preceding groups. These commodities are here considered under the heading of miscellaneous building materials.

Roofing materials.

Three price series on roofing papers are shown in Table 77. Except in the case of rubber roofing paper, prices for 1919 have not been found that are quoted on the same basis as the prices here shown. The table shows reductions in prices of rubber roofing paper since the beginning of the year 1919. This kind of a material rose less rapidly than the others on account of the conspicuously small rise in prices of rubber as compared with other commodities. Another series of quotations not given here shows tarred felt paper in April, 1919, to have declined about 19 per cent since the beginning of the year.

Three manufacturers of prepared roofing materials have furnished some data on production costs. Averages of their figures indicate that in 1918 the labor cost was 8.7 per cent of the total production

cost; raw materials accounted for 77.6 per cent; fuel, 2.7 per cent; transportation, 3.8 per cent; other elements, 7.2 per cent. It is thus seen that prices of these products are affected more by the prices of raw materials than by all other factors combined, and that advances and declines in prices are mainly dependent upon corresponding advances and declines in the raw materials.

According to figures furnished by the manufacturers mentioned above, the labor cost in 1918 was 80 per cent greater than in 1913; the cost of raw materials was 88 per cent greater; fuel, 170 per cent; transportation, 78 per cent; other elements, 77 per cent. The total production cost increased during this period 87 per cent, according to these figures.

In 1918, the Government ordered curtailment of production of composition roofing by 60 per cent of normal capacity.

Sanitary porcelain.

Two series of prices on sanitary porcelain are given in Table 77. In both series the index for the last quarter of 1918 is less than for the previous quarter. This is due to considerable reductions in the month of December. The porcelain sinks were quoted in November at $27.56, and in December at $21.20; this reduction amounted to 23 per cent. Urinals were quoted in November at $33.07, and in December at $25.44, this reduction amounting also to 23 per cent.

Production conditions affecting sanitary porcelain were pretty much as described in Section IX (Clay products). In 1918 the Fuel Administration ordered curtailment of production of pottery to 50 per cent of normal.

An important producer of sanitary pottery has furnished data on production costs. According to his figures, in 1918 labor accounted for 63 per cent of the total production cost; raw materials, 10 per cent; fuel, 6 per cent; other elements, 21 per cent. In 1918 labor costs were 40 per cent greater than in 1913; raw materials increased 60 per cent; fuel cost, 60 per cent; transportation, 35 per cent; other elements, 60 per cent. The total production cost was 51 per cent greater in 1918 than in 1913.

Plumbing and heating materials.

Table 78 gives prices on nonferrous metal products which are used as plumbing and electrical supplies. Figures on 6-inch cast-iron pipe are given in Section VIII. No attempt has been made to secure price series on the more highly manufactured products in the plumbing and heating group.

Production figures on lead and zinc are given in connection with Section XIV (Paint materials).

Many manufacturers of plumbing and heating specialties turned their attention to production of ordnance material and other war

munitions. This involved a decrease in production of plumbing, heating, and ventilating materials. Decrease in production of cast-iron boilers and radiators to the extent of 50 per cent of normal capacity was ordered by the Fuel Administration in 1918. The decreased production, together with increases in production costs, led to higher prices. Substantial reductions in these lines were announced early in 1919.

Several important producers of plumbing materials furnished to the Division of Public Works and Construction Development data on production costs. According to averages obtained from these figures, in 1918 the labor cost was 37.2 per cent of the total production cost; raw materials, 43.5 per cent; fuel, 4.4 per cent; other elements, 14.9 per cent.

According to the same authorities the increase in labor cost from 1913 to 1918 was 78.5 per cent; in cost of raw materials, 76 per cent; in fuel cost, 70 per cent; in other elements of production cost, 69 per cent. The increase in total production cost was 76 per cent.

An important firm which manufactures radiators has reported that in 1918 its production cost was divided as follows:

	Per cent.
Labor	41.7
Raw materials	46.7
Fuel	7.3
Transportation	1.6
Other elements	2.7

The same firm stated that its increases in elements of cost from 1914 to 1918 were as follows:

	Per cent.
Labor	75
Raw materials	74
Fuel	175
Transportation	48
Other elements	56
Total production cost increased	81

Naval stores and asphalt.

Price series on rosin, pine tar, and asphalt are given in Table 79. In connection with naval stores, prices and production figures on turpentine, included in section XIV (paint materials), should be considered.

Production figures on rosin are as follows:[a]

Year ended April 1—	500-pound barrels.	Year ended April 1—	500-pound barrels.
1913	2,266,000	1917	1,782,000
1914	2,131,000	1918	1,530,000
1915	1,705,000	1919[b]	915,000
1916	1,565,000		

[a] Estimated.
[b] Figures from Naval Stores Review and Journal of Trade, Apr. 6, 1919.

In the case of this commodity the very considerable decrease in production, coupled with an increased demand occasioned by the shipbuilding program, caused a very considerable rise in prices.

The April, 1918–March, 1919, production figure is 40 per cent under the figure for the previous year, while prices during the first quarter of 1919 had advanced 224 per cent over the pre-war figure.

The figures on asphalt are not complete. The fact that figures on the New York market for the greater part of 1918 are lacking is explained by the fact that there was practically no asphalt in stock in this market during the greater part of the year.

Metal lath.

Quotations on expanded metal lath are given in Table 80. Since these figures do not extend over the six-year period that has been considered in connection with most of the other commodities that have been studied, indices have not been computed. Instead, the advances for April, 1919, over the first quarter of 1917 are given. The average of the advances for this period in the six markets is 65 per cent. The figures that are given for some of the markets for periods earlier than 1917 show that the advance over the year preceding July 1, 1914 would probably be considerably larger than this.

Early in 1919 the chairman of the War Service Committee on Metal Lath stated that productive capacity in the industry was being employed at only 25 per cent of capacity, owing to the slight demand for the product at that time. He attributed high prices to the increases in wages, and to increased cost of material, fuel, and transportation.

Builders' hardware and lighting fixtures.

No attempt has been made to secure price data on builders' hardware and lighting fixtures since these products scarcely come within the classification of basic materials. As in the case of producers of heating and plumbing materials, this group of manufacturers was able to utilize its plants for the production of war materials. In 1918 the Government ordered curtailment of production of builders' hardware by 60 per cent of the total capacity.

Average figures based on statements made by representative manufacturers of builders' hardware indicate that the 1918 cost of production was 83 per cent higher than the 1913 cost. According to these figures the labor cost increased 110 per cent; raw materials, 80 per cent; fuel cost, 100 per cent; other elements of cost, 50 per cent. The 1918 production cost was divided as follows: Labor, 41 per cent of total; raw materials, 24 per cent; fuel, 3 per cent; other elements, 32 per cent.

Producers of lighting fixtures, particularly those who make goods of high quality, were seriously affected by the war, except such of

them as secured contracts for munitions. It was stated early in 1919 that factories producing this line of goods were operating at only 40 per cent of capacity.

Gypsum products.

No price series has been included on this group of materials. However, the use of gypsum partition blocks and other gypsum materials has increased considerably within the past few years, and this is growing to be a material of considerable importance.

Four-inch partition tile was quoted in Chicago (dealer's price, delivered on the job) at 7½ cents per foot in January, 1917, and at 11 cents per foot in December, 1918; a rise of 47 per cent. Three-eighths inch plaster board was quoted in New York (dealer's price, delivered on the job) in November, 1917, at 20 cents per 32 by 36 inch sheet, and in December, 1918, at 30 cents per sheet; an increase of 50 per cent.

Early in 1919 this industry was operating at 50 per cent of the average capacity of the years 1915, 1916, and 1917, and production costs were said at that time to have increased 100 per cent over 1913. This increase was due to an increased labor cost of 109 per cent; an increased fuel cost of 75 per cent, and an increase in other elements of production cost of 97 per cent. In 1918, the labor cost was said to represent 47 per cent of the total cost of production of gypsum products.

Millwork.

Lumber prices have been treated fairly comprehensively in Section VII.

Certain figures on costs of production of millwork are of interest and are given here. These figures were obtained from the millwork industry through the courtesy of the chairman of its War Service Committee. Averages of the figures presented show the 1918 production cost to have been distributed as follows: Labor, 30 per cent; raw materials, 58 per cent; transportation, 4 per cent; other elements, 8 per cent. Most woodworking factories burn their own waste for power, and hence have no coal consumption.

According to the statements furnished, from 1913 to 1918, the labor cost increased 66 per cent; raw materials, 103 per cent; transportation, 50 per cent; other elements, 77 per cent. The total production cost increased 88 per cent.

TABLE 77.—*Wholesale market prices on roofing materials and sanitary porcelain.*

[Quotations from price section, War Industries Board.]

Commodity	Roofing materials.						Porcelain sanitary ware.			
	Building paper, rosin-sized, sheathing.		Tarred felt paper, 3-ply.		Rubber roofing paper, first quality, 1-ply.		Kitchen sinks, 36 by 24 inches, high back.		Urinals, white, glazed finish.	
Market	New York.		New York.		New York.		East of Mississippi River.		East of Mississippi River.	
Unit	25-pound roll.		Roll.		108-square-foot rolls, 32 inches wide, 35 pounds.		Apiece.		Apiece.	
Period.	Price per roll.	Relative price.	Price per roll.	Relative price.	Price per roll.	Relative price.	Quoted price.	Relative price.	Quoted price.	Relative price.
July 1, 1913, to June 30, 1914.	$0.4000	100	$0.6800	100	$1.1500	100	$13.9800	100	$16.1700	100
1913	.4000	100	.6800	100	1.1500	100	13.9800	100	16.1700	100
1914	.4000	100	.6800	100	1.1500	100	13.9800	100	16.1700	100
1915	.4000	100	.6888	101	1.1375	99	13.9800	100	16.1700	100
1916	.6092	152	1.0171	150	1.3500	117	13.4133	96	16.1700	100
1917	.9525	238	1.1450	168	1.5708	137	15.9558	114	17.3350	107
1918	.8083	202	1.2133	179	1.4500	126	24.2725	174	27.2042	169
1917:										
First quarter	.9933	248	1.1317	166	1.5833	138	13.4667	96	16.1700	100
Second quarter	.9500	238	1.1650	171	1.6500	143	14.6867	105	16.4333	102
Third quarter	1.0167	254	1.1533	170	1.6000	139	17.5600	126	18.0867	112
Fourth quarter	.8500	212	1.1300	166	1.4500	126	18.1100	130	18.6500	115
1918:										
First quarter	.8333	209	1.1633	171	1.4500	126	18.6500	134	18.6500	115
Second quarter	.8000	200	1.2300	181	1.4500	126	25.4400	182	26.5700	156
Third quarter	.8000	200	1.2300	181	1.4500	126	27.5600	197	33.0700	205
Fourth quarter	.8000	200	1.2300	181	1.4500	126	25.4400	182	30.5267	189
1919:										
First quarter					1.3500	117				
April					1.3500	117				

TABLE 78.—*Wholesale market prices on nonferrous metal products.*

[Series 1, 2, and 3 from price section, War Industries Board. Series 4 and 5 from Bureau of Labor Statistics.]

Commodity	1. Lead pipe.		2. Sheet lead.		3. Solder, half and half, case lots.		4. Zinc, sheet.		5. Copper wire, bare No. 8, B. & S. gauge, and heavier.	
Market	New York.		New York.		New York.		F. o. b. La Salle and Peru, Ill.		Waterbury, Conn.	
Period.	Price per cwt.	Relative price.	Price per cwt.	Relative price.	Price per pound.	Relative price.	Price per cwt.	Relative price.	Price per pound.	Relative price.
July 1, 1913, to June 30, 1914	$4.8725	100	$5.5750	100	$0.2602	100	$6.7658	100	$0.1616	100
1913	5.0708	104	5.6767	102	.2917	112	7.2450	105	.1673	104
1914	4.5175	93	5.1983	93	.2286	88	6.9192	102	.1465	91
1915	5.3650	110	6.1192	110	.2535	97	16.1575	239	.1850	114
1916	7.6708	157	8.3550	150	.2815	108	18.7833	278	.3052	189
1917	10.1217	208	10.6392	191	.3738	143	18.0933	267	.3300	204
1918	8.8892	182	9.3792	168	.5817	224	14.2381	210	.2762	171
1917:										
First quarter	9.3067	191	9.9967	178	.3379	130	19.3200	286	.3675	227
Second quarter	11.3267	233	11.8167	212	.3671	141	18.0933	267	.3475	215
Third quarter	11.8467	243	12.3367	221	.3933	151	17.4800	258	.3175	197
Fourth quarter	8.0067	164	8.4967	152	.3967	152	17.4800	258	.2875	178
1918:										
First quarter	8.2500	169	8.7400	157	.5100	196	15.5524	230	.2625	163
Second quarter	8.6867	178	9.1767	165	.6200	238	13.8000	204	.2639	163
Third quarter	9.3100	191	9.8000	176	.6267	241	13.8000	204	.2883	179
Fourth quarter	9.3100	191	9.8000	176	.5700	219	13.8000	204	.2900	180
1919:										
First quarter	7.5133	154	.....	.....	.....	.....	10.6132	157	.2019	125
April	6.5170	134	.....	.....	.....	.....	9.2000	136	.1748	108

TABLE 79.—*Wholesale market prices on naval stores and asphalt.*

[Series 1 and 2 from price section, War Industries Board. Series 3 to 7 from the Engineering News-Record.]

Commodity	Naval stores.				Asphalt.				
	1. Rosin, grade F.		2. Tar, pine.		3. Texaco brand in packages.	4. Texaco brand in packages.	5. Mexican brand in packages.	6. Mexican and Texaco in packages.	7. California brand in packages.
Market	Savannah.		Wilmington, N. C.		New York.	Chicago.	St. Louis.	Dallas.	San Francisco.
Period.	Price per barrel.[1]	Relative price.	Price per barrel.[2]	Relative price.	Price per ton.	Price per ton.	Price per ton.	Price per ton.	Price per ton.
July 1, 1913, to June 30, 1914	$3.9150	100	$2.2292	100	.....	.....	.....	.....	.....
1913	4.6500	119	2.2250	100	.....	.....	.....	.....	.....
1914	3.8063	97	2.1875	98	.....	.....	.....	.....	.....
1915	3.5621	91	1.7333	78	[3]$14.7500	.....	.....	.....	.....
1916	5.5083	141	2.2542	101	18.0909	$21.2727	.....	.....	$10.7273
1917	5.7958	148	3.1917	143	[4]21.2917	[4]23.3333	$21.2500	$21.3750	15.0833
1918	9.2917	237	3.6730	165	.....	30.2500	23.2250	30.7500	15.9583
1917:									
First quarter	6.1167	156	2.7000	121	[4]19.1667	[4]22.0000	18.0000	19.0000	14.8333
Second quarter	5.7000	146	3.0667	138	[4]19.0000	[4]22.6667	22.0000	19.0000	14.5000
Third quarter	5.2333	134	3.5000	157	[4]19.0000	[4]24.0000	22.5000	22.5000	14.5000
Fourth quarter	6.1333	157	3.5000	157	[4]28.0000	[4]24.6667	22.5000	25.0000	16.5000
1918:									
First quarter	6.0167	154	3.2364	145	30.0000	25.0000	21.0000	29.0000	15.5000
Second quarter	6.2500	160	3.2773	147	.....	25.0000	24.0000	30.3333	15.5000
Third quarter	10.9333	280	3.9909	179	.....	35.5000	22.5000	31.6667	16.3333
Fourth quarter	13.9667	357	4.1875	188	.....	[4]35.5000	[5]25.4000	32.0000	16.5000
1919:									
First quarter	[6]12.7667	324	4.2708	190	30.0000	[4]35.5000	[5]29.0667	32.0000	17.0000
April	[6]10.9500	280	4.2500	189	22.0000	[4]35.5000	[5]26.4000	32.0000	17.0000

[1] Barrel, 280 pounds.
[2] 1913, 1914, 1915, barrel of 50 gallons; 1916, 1917, 1918, 1919, barrel of 48 gallons.
[3] Figures for second half of year.
[4] Mexican brand.
[5] Stanolind brand.
[6] Estimates based on New York prices.

TABLE 80.—*Wholesale market prices on expanded metal lath, Ga. 27; weight, 233; painted.*

[Prices per 100 yards in carload lots. Figures from the Engineering News-Record.]

Period. \ Market	New York.	Pittsburgh.	St. Louis.	Chicago.	Dallas.	San Francisco.
1915: Fourth quarter	$11.4400	$13.3800	.....	.....	.....	.....
1916:						
First quarter	.....	.....	.....	.....	.....	.....
Second quarter	15.1733	16.6900	[1]$18.0000	.....	.....	.....
Third quarter	18.7000	18.5000	19.8000	$18.1500	.....	$18.1500
Fourth quarter	19.8000	18.5000	19.8000	17.4767	.....	17.8800
1917:						
First quarter	21.0200	23.0000	21.0000	21.0000	[2]$20.0000	19.0000
Second quarter	25.4400	27.1667	26.0000	25.3333	23.5000	25.6667
Third quarter	31.0000	32.0000	32.6667	30.0000	31.0000	29.0000
Fourth quarter	31.0000	33.0000	34.0000	31.0000	32.0000	29.0000
1918:						
First quarter	30.9900	33.0000	34.0000	31.0000	32.0000	29.0000
Second quarter	30.9700	33.0833	34.0000	31.0000	32.5000	29.0000
Third quarter	34.0700	33.2500	34.0000	31.0000	32.5000	32.0000
Fourth quarter	33.0467	33.2500	34.0000	31.0000	33.0556	38.0000
1919:						
First quarter	34.0700	33.2500	34.0000	31.0000	33.8044	38.0000
April	34.0700	33.2500	34.0000	31.0000	34.7500	38.0000
Advance April, 1919, over first quarter 1917.....per cent	62	45	62	48	74	100

[1] Figure for June, 1916.
[2] Figure for March, 1917.

IV. LABOR AND WAGES IN THE CONSTRUCTION INDUSTRY.

NEW CONDITIONS.

The exigencies of the war demanded both new types of construction and a new geographical distribution of construction. These new factors affected building tradesmen in a variety of ways. The new types of construction, while increasing the demand for certain groups of building craftsmen, lessened, sometimes to the point of elimination, the demand for certain other groups. The new geographical distribution, at the same time that it favored many workmen, compelled others to ply their trade away from home or to engage in other occupations. Conditions such as these make difficult a comparison of the status of building craftsmen in general in 1918 with their status in prewar years.

Some idea of the adverse effect of the war on certain craftsmen may be gained from a report of the proceedings of the twelfth annual convention of the Buildings Trades Department of the American Federation of Labor, held at St. Paul, Minn., June 5, 1918. On page 78 of this report is printed a resolution (which was adopted by the building trades department) to the following effect:

> Whereas our Government was compelled to declare war against Germany after u ffering many indignities at the hands of the Imperial Government of Germany; and
>
> Whereas the declaration of war found our Government wholly unprepared and, in order to meet emergencies for the housing of enlisted men, was compelled to build cantonment buildings. The time to meet this emergency being limited compelled our Government to construct these buildings in a temporary manner, and naturally the haste required made it necessary to omit certain details in the construction of these buildings which would have a direct tendency to protect both the health and the comfort of our boys who are to fight the battles for the preservation of democracy and freedom; and
>
> Whereas our Government can now take the time and secure the men to make these buildings more sanitary and more comfortable for our boys by plastering the same; and
>
> Whereas the plastering of these buildings means the saving of thousands of tons of coal in the heating, and as coal is one of the necessary essentials in the winning of the war, we feel it should be the plain duty of our Government to conserve the consumption of coal in every manner possible: Therefore be it
>
> *Resolved*, That the delegates attending this convention are of the unanimous opinion that these buildings should be plastered and painted for the reason herein stated; and be it further
>
> *Resolved*, That a committee of three be appointed by the president of the building trades department to act in conjunction with him in presenting this matter to the proper authorities in Washington.

In addition to the patriotic concern evinced by this resolution, it is patent that the plasterers and painters, who had suffered through

lack of employment in their trades, were desirous of the employment which the concurrence by the Government in their resolutions would insure. At least such is the interpretation that the annual report of the executive council of the building trades permits. On page 45 the executive council reports:

> There was submitted to your council a series of communications from President Hedricks, of the Brotherhood of Painters and Decorators, urging that necessary steps be taken by the department in cooperation with the Brotherhood of Painters toward securing employment for the members of the brotherhood on cantonment camps, as well as the general building program of the Government. The correspondence was supplemented by letters from the District Council of Painters of Indianapolis, Ind., in which a similar request was made. The importance of direct action on the subject was deemed to be advisable, and accordingly your executive council instructed the officers to take up the matter with the proper authorities and urge that all camps and other Government operations, especially frame structures, be treated to an application of paint. This course was deemed necessary in order to prevent deterioration on account of changing climatic conditions and to make the quarters of the enlisted men comfortable and sanitary, as well as to alleviate the distress caused by the nonemployment of the Brotherhood of Painters generally.

A discussion of the resolution introduced by the International Hod Carriers, Building, and Common Laborers' Union, on the question of chartering shipbuilding laborers is likewise illuminating as to the status of certain trades:

> Delegate Bowen, Bricklayers and Masons, opposed the recommendation of the committee. He stated that bricklayers, owing to conditions imposed upon the industries because of war activities, were working as laborers, and insisted that they should not be compelled to become members of the Hod Carriers and Building Laborers, but should be allowed to retain their cards in the organization of the trade to which they belonged, in which they have pride, and which they spent years to learn.
>
> Delegate Leonard, Plumbers, stated that he would not oppose any program that would help to completely organize the building laborers, as he felt the real foundation of all future success of organized labor rested upon the thorough organization of common labor. He spoke at length of the change in industry since the beginning of the war, the necessity of skilled workers in some crafts taking positions where little or no skill is required, sometimes because of a scarcity of common labor and in other instances because of a lack of employment in their own trades.

But in spite of the abnormal conditions prevailing in the construction industry, building tradesmen did not suffer that worst of all industrial evils—unemployment. Work *was* procurable, if not in all interior sections, at least along the coasts, and in large industrial communities; and if not in the building trades, at least in other trades.

THE ATTITUDE OF THE GOVERNMENT TOWARD LABOR IN THE CONSTRUCTION INDUSTRY.

The attitude of the Government toward labor in construction industry is briefly summarized in the statement of June 7, 1917, issued by the War Department and signed by Newton D. Baker and Samuel Gompers:

> For the adjustment and control of wages, hours, and conditions of labor in the construction of cantonments there shall be created an adjustment commission of three persons, appointed by the Secretary of War; one to represent the Army, one the public, and one labor; the last to be nominated by Samuel Gompers, member of the advisory commission of the Council of National Defense, and president of the American Federation of Labor.
>
> As basic standards with reference to each cantonment, such commission shall use the union scale of wages, hours, and conditions in force on June 1, 1917, in the locality where such cantonment is situated. Consideration shall be given to special circumstances, if any, arising after said date which may require particular advances in wages or changes in other standards. Adjustments of wages, hours, or conditions made by such boards are to be treated as binding by all parties.

The reference to conditions in force on June 7, 1917, was interpreted by Mr. Gompers and the War Department as referring only to union hours and wages and not to the closed or open shop.

To what extent the union wage rate of the community was the prevailing rate on Government construction it is impossible as yet to determine. Industrial relations divisions of various governmental agencies that had to do with the employment of building trades labor made it, of course, their policy to engage labor at the most advantageous rate possible under the Government policy. That rate could be no lower than the union wage scale of the community concerned. The Building Trades Department of the American Federation of Labor registered protests against the action of certain contractors who were paying less than the prevailing rate of wages, but such conditions were quickly remedied by governmental agencies to whose attention they were called.

However, the ever increasing shortage in labor and the ever more insistent demand for emergency construction during the year 1918 developed in certain communities rivalries among contractors for building craftsmen. As a result wages in excess of the union scale were paid and by the end of the year 1918 such wages were common.

The report of the Industrial Relations Division of the United States Housing Corporation throws an interesting light on the development of the labor situation in the building trades in the latter part of 1918. The Housing Corporation began its work in August and found that common labor had been absorbed by other war industries of the Government and that it had to enter into the market for labor with the supply almost completely exhausted. By November 1, after employing numerous field agents to scout for labor and call-

ing upon the United States Employment Service, it was able to man its projects only to the extent of 50 per cent. The experiences of the Housing Corporation can not therefore be looked upon as typical—they show somewhat extreme conditions. To quote from Frank J. Warne, manager of the Industrial Relations Division:

> There being no centralized governmental control over wages, hours of work, and general working conditions, each contractor and each Government department was a law unto himself and itself. The hourly rate for common labor rose within a few months from 25 cents to as high as 60 cents in places. Hours of work were increased from 8 for each week day, excepting Saturday, to as high as 14. The Saturday afternoon holiday went a glimmering, work thereon being paid for at time and a half and double for overtime above four hours. Sunday work with double pay in many instances became the rule, in order to secure and hold the men. The "stealing" of labor by one department of the Government from another was an almost daily occurrence.
>
> In the matter of wage scale the policy of the division has been to instruct the contractor to secure a copy of the rates of wages and working time in any particular locality from the examiner in charge of the nearest branch of the United States Employment Service and not to vary from these established rates and conditions without instructions from the division. But in very few localities were the established rates being observed, and the Industrial Relations Division soon found itself involved in a contest of wage increase. In only two instances, so far as the manager of the division is aware, were the contractors of the Housing Corporation the first to vary from the established local rates.

The difficulties of the United States Housing Corporation were further accentuated by the award of the Wage Adjustment Board of the United States Shipping Board. This award increased wages 15 per cent to meet the increase in the cost of living and as a result common labor was advanced from 46 cents to 54 cents. The Housing Corporation decided not to meet the increase of the Shipping Board and hence lost a large number of its carpenters and other craftsmen to the Emergency Fleet Corporation.

WAGES AND THE COST OF LIVING.

Earnings in 1914 and 1918.

It is as yet impossible to present an adequate survey of the effect of the war on wages of American workmen, for statistics on wages are not yet sufficiently available. In addition, the abnormal conditions which prevailed during 1918 make necessary a much more careful use of the available data of that year and render dangerous generalizations based on partial data. The latest and most comprehensive survey of wages for the years 1914–1918 available is contained in the Labor Market Bulletins published by the Bureau of Labor Statistics of New York State. In these bulletins the average weekly earnings of New York State factories are given for the years 1914 to 1919. In Table 81 only the years 1914 and 1918 are used. The weekly earnings of 1918 are those of the last week in December.

Comment on Table 81: The workmen who gained most during these years were those in the metals, machinery, and conveyance group, whose earnings increased from $14.24 to $27.39, or 92.3 per cent. In that group the workmen of the cars, locomotives, and railway repair shop group received the greatest increase, from $14.34 to $34.07, or 137.5 per cent. The wages of workmen in the pig iron and rolling-mills product group were advanced from $16.63 to $37.97, or 129.2 per cent. The workmen in the printing and paper-goods industry benefited least. Their wages were increased from $15.16 to $22.67, or 49.6 per cent. The varying increases in wages in these different groups responded in a general way to the war demand on the industries represented by these groups. The workmen in the metals group, whose industry was most in demand, enjoyed the greatest increase.

The United States Bureau of Labor Statistics has computed index figures of average weekly earnings in New York State factories, these indices being based on the average for June, 1914, as 100 per cent. The indices are: January, 1919, 181; February, 1919, 174; March, 1919, 175; April, 1919, 174; May, 1919, 175; June, 1919, 177. The decrease from the 1918 average is probably largely due to the decrease in amounts of pay for overtime, etc.

The Bethlehem Steel Corporation released to the press in April, 1919, a statement of the average number of its employees, the total wages paid, and the average wages paid per employee per month, for the years 1909 to 1918.

In the table below the wages per month and per week for the years 1913 to 1918 are given and the percentage increase from 1913 to 1918 and from 1914 to 1918.

Year.	Average number of employees.	Salaries and wages paid.	Average per employee—	
			Per month.	Per week.
1913	15,052	$13,366,399.92	$74.00	$17.07
1914	15,586	14,312,948.78	76.53	17.66
1915	22,064	21,300,664.91	82.34	19.00
1916	47,013	51,499,773.45	91.28	21.06
1917	64,782	83,978,312.80	108.03	24.93
1918	93,964	167,118,484.14	148.21	34.20

Percentage increase, 1913–1918, 100.3.
Percentage increase, 1914–1918, 93.6.

Comment: The increase in weekly earning of the employees of the Bethlehem Steel Corporation from 1914 to 1918, 93.6 per cent, corresponds almost exactly to the increase in weekly earnings of the workmen in the metals, machinery, and conveyance group in New York State factories, 92.3 per cent.

Union wage rates from 1913 to 1918.

The Bureau of Labor Statistics published in the Monthly Labor Review of March, 1919, a scale of the changes in the union wage rates from 1907 to 1918. The years that concern us here, 1913 to 1918, are given in the table below:

[1913, 100 per cent.]

Year.	Rates of wages per hour.	Full-time hours per week.	Rates of wages per week, full time.
1913	100	100	100
1914	102	100	102
1915	103	99	102
1916	107	99	106
1917	114	98	112
1918	133	97	130

The following trades are covered by the report of the Bureau of Labor Statistics on union wage rates:

1. Building trades.
2. Granite and stone trades.
3. Metal trades.
4. Laundry workers.
5. Theatrical employment.
6. Waiters.
7. Printing and publishing: Book and job.
8. Chauffeurs, teamsters, and drivers.
9. Bakery trades.
10. Mill work.
11. Printing and publishing: Newspaper.

The metal trades show a rather large increase in the union wage rate of 1918 over 1914. A comparison of the hourly rate of 1918 with that of 1914 for 41 important American cities [1] gives the following results:

	Per cent.		Per cent.
Machinists, railroad and shop	75	Pattern makers	69
Metal polishers and buffers	51	Blacksmiths, manufacturing shops	66
Iron molders	59	Blacksmiths, railroad shops	74

[1] The cities are:

Atlanta, Ga.	Detroit, Mich.	Milwaukee, Wis.	Providence, R. I.
Baltimore, Md.	Fall River, Mass.	Minneapolis, Minn.	Richmond, Va.
Birmingham, Ala.	Indianapolis, Ind.	Newark, N. J.	St. Louis, Mo.
Boston, Mass.	Jacksonville, Fla.	New Haven, Conn.	St. Paul, Minn.
Buffalo, N. Y.	Kansas City, Mo.	New Orleans, La.	Salt Lake City, Utah.
Charleston, S. C.	Little Rock, Ark.	New York, N. Y.	San Francisco, Calif.
Chicago, Ill.	Los Angeles, Calif.	Omaha, Nebr.	Scranton, Pa.
Cincinnati, Ohio.	Louisville, Ky.	Philadelphia, Pa.	Seattle, Wash.
Cleveland, Ohio.	Manchester, N. H.	Pittsburgh, Pa.	Springfield, Ill.
Dallas, Tex.	Memphis, Tenn.	Portland, Oreg.	Washington, D. C.
Denver, Colo.			

Granite cutters for the same cities received an increase of 27 per cent. Among the groups which obtained only slight increases in hourly wage rates are those in the newspaper, printing and publishing, and book and job, printing and publishing, groups.

Union wage rates in the building trades in 1914 and 1918.

Table 82 gives figures on average union wage rates in the building trades. Table 83 gives figures in detail for 41 cities, and Table 84 gives a summary of Table 83.

The average increase in the union wage rate of building trades labor from 1914 to 1918 is 28.5 per cent. This increase applies only to the 41 important American cities given above. Below is the table of the average increase of some of the trades in the building industry:

	Per cent.		Per cent.
Bricklayers	19.7	Plasterers	18.5
Building laborers	56.7	Plasterers' helpers	30.2
Carpenters	36.2	Plumbers and gas fitters	31.4
Cement workers and finishers, inside	29.1	Sheet-metal workers	33.7
Engineers, portable and hoisting	24.9	Steam fitters	32.9
Hod carriers	41.1	Steam fitters' helpers	40.8
Inside workmen	40.3	Stonemasons	22.1
Marble setters	13.7	Structural iron workers	28.8
Marble setters' helpers	24.7	Structural workers' helpers	30.2
Painters	34.4	Tile layers	15.0
Sign painters	20.4	Tile layers' helpers	19.2

An examination of these increases shows that unskilled labor—building laborers, hod carriers, and helpers—enjoyed as a rule far greater increases than skilled labor.

The average increase from year to year in the union wage rate of the building trades are shown graphically in Chart XIII.

Union wage rates and the war.

The union wage rates of Tables 82, 83, and 84 are those of May of each year. It must be remembered that union wage rates are *minimum* wage rates. A comparison of the union wage rates of one year with those of another would, in normal years, provide a fairly accurate index of the relative earnings of those years. However, conditions in 1918 were so different from those existing in 1913 that it is not safe to say that the index number of the earnings of 1918 corresponds with the index number of the rates of wages of 1918.

The reasons for assuming a disparity in the index number of the union *wage scales* and in the index number of *earnings* may be found in the following considerations: As a result of the pressure of war work and of the shortage of labor, it may safely be said of industry in general in 1918 (1) that employment was more continuous than in 1913; (2) that overtime figured more largely than in 1913; (3)

that wages in excess of the union wage minimum were paid more frequently than in 1913; (4) that the union wage rate of May, 1918, was far less frequently the wage rate of the whole year than the corresponding rate was in 1913.

In those trades and in those communities in which one or more of these factors was operative in 1918 (other conditions remaining the same) the index number of *total earnings* of 1918 would be considerably above the index number of the *rates of wages* of 1918. It is certain that in some trades the general conditions of 1913 with respect to overtime, continuity of employment, and observance of the union wage rate applied in 1918. In general it seems safe to assume that one or more of these factors was effective in 1918 and that hence *the index number of earnings for 1918 was raised above that of wage rates.* It is difficult, however, on the basis of present information to hazard an estimate even as to the approximate position of that index number.

Adjusting wages to the cost of living.

The rapid rise in the cost of living during the war necessitated the recognition on the part of the Government of a policy of adjusting wages to meet the increase in the cost of living. By implication such a policy is contained in the principles adopted by the War Labor Conference Board and followed by the National War Labor Board, under the caption—

THE LIVING WAGE.

1. The right of all workers, including common laborers, to a living wage is hereby declared.

2. In fixing wages, minimum rates of pay shall be established which will insure the subsistence of the worker and his family in health and reasonable comfort.

The memorandum creating the Shipbuilding Labor Adjustment Board provides still more clearly the ground for readjustment of wages:

At any time after six months have elapsed following such ratified agreement, or any such final decision by the adjustment board on any question as to wages, hours, or conditions in any plant or district, such question may be reopened by the adjustment board for adjustment upon the request of a majority of the craft or crafts at such plant affected by such agreement or decision, provided it can be shown that there has been a general and material increase in the cost of living.

As a result of these policies on the part of governmental agencies, the demands of workmen were as never before considered with respect to the increase in the cost of living. In normal years the demands of workmen for higher wages are usually interpreted as demands for greater shares in the profits or for better standards of living, or for both. Though those factors were still operative among workmen in 1918, it is obvious that with the rapid advances in the cost of living,

the compelling cause of an increase in wage rates among workers in general was the necessity for meeting the increase in the cost of living.

In order to obtain reliable figures for the increase in the cost of living, upon which to base wage increases, the Shipping Board requested the Bureau of Labor Statistics of the United States Department of Labor to make a statistical investigation of the increase in the cost of living for workers. The Bureau of Labor Statistics undertook accordingly a survey of living conditions in shipbuilding communities and published at certain intervals the increase in the cost of living reflected in those communities. The decisions of the Shipbuilding Labor Adjustment Board were based on the findings of this bureau. The award of the Shipbuilding Labor Adjustment Board of October 1, 1918, however, did not apply the entire increase in the cost of living to all occupations. In the more highly paid occupations the Shipping Board felt justified in not granting the full increase for the reason quoted: "We have not deemed it necessary or wise to apply this entire increase in the cost of living to occupations already above the base rate of the scale for the skilled trades. As in assessing the income tax, the Government exempts altogether small incomes while taking more than three-fourths of the income of the multimillionaire, so in adjusting wages, while granting an advance to laborers and helpers fully sufficient to offset the increase in the cost of living, we have not considered it proper to grant the full increase to the more highly paid occupations."

Increase in the cost of living.

The investigations of the Bureau of Labor Statistics into the increase in the cost of living for workers in shipbuilding communities show the following percentages of increase for December, 1917, and December, 1918, over December, 1914.

City.	December, 1917.	December, 1918.	City.	December, 1917.	December, 1918.
	Per cent.	*Per cent.*		*Per cent.*	*Per cent.*
Baltimore, Md	51.27	86.37	New York, N. Y	44.68	78.79
Boston, Mass	38.13	70.29	Norfolk, Va	45.15	80.73
Buffalo, N. Y	51.13	82.33	Philadelphia, Pa	43.81	75.02
Chicago, Ill	41.78	74.14	Portland, Me	37.96	72.38
Cleveland, Ohio	42.93	73.90	Portland, Oreg	31.23	65.50
Detroit, Mich	49.85	79.80	San Francisco and Oakland, Calif	28.63	58.38
Houston, Tex	44.89	74.61	Savannah, Ga	42.49	68.63
Jacksonville, Fla	41.63	79.88	Seattle, Wash	31.08	70.47
Los Angeles, Calif	28.85	58.88			
Mobile, Ala	43.16	72.39	Average	41.04	73.47

Cost of living computations upon which to base conclusions for the whole country have not yet been tabulated by the Bureau of Labor Statistics. It is not unlikely that the shipbuilding communities chosen are typical of industrial communities which benefited from

war activity. Additional figures indicate that the average increase in these shipbuilding communities for June, 1919, would be somewhat above the figure for December, 1918—somewhere about 76 or 77 per cent, probably. The increases in 1919 are due to increases in cost of food in the second quarter of the year and also to increases in rents.

The National Industrial Conference Board makes estimates of the increase in the cost of living for the whole country based upon prices gathered by the Bureau of Labor Statistics and upon its own investigation. It has published two sets of figures for 1918; one on the cost of living increase between July, 1914, and June, 1918, 50 to 55 per cent; the other, the increase between July, 1914, and November, 1918, 65 to 70 per cent.

A comparison of the increase in the wage scale of the building trades with increases in the various elements of the cost of living is shown graphically in Chart XIV.

The cost of living and wages in 1918 with particular reference to the wage rate in the building trades.

Workmen in the metals group, particularly, enjoyed increases greater than the increase in the cost of living. Workmen in many other factory groups, if the New York factory statistics may be looked upon as typical, enjoyed increases approximating the increase in the cost of living. Unskilled workers and common labor, as a result of the application of the living wage principle and of the shortage of this type of labor, seem usually to have increased their earnings at least in proportion with the increase in the cost of living.

The index number of the wage rate for 1918 of *many* groups, among them the building trades and the printing groups, is considerably *below* that of the index number of the cost of living. The disparity, however, between the index number of the cost of living of 1918 and that of the wage rate in the building trades of 1918, does not mean that there has not been a considerable readjustment of wage rates in the building trades to meet the increase in the cost of living *since America entered the war in 1917*. The index numbers for the cost of living and the union wage rates all use a 1913 or a 1914 base. Many of the wage adjustments made during the war, and notably those of the Shipbuilding Labor Adjustment Board use the wage rate of 1917 as a base.

The use of 1917 as a base for both the cost of living and the union wage rate of the building trades tells a different story. The index number of the wage rate for May, 1917 (with May, 1914, as the base), is only 108 for the 41 cities mentioned above. But the index number for May, 1918 (with May, 1914, as a base), is over 128; in other words an increase over the new base of 1917 of 18 per cent in one

year. This increase corresponds fairly closely to the increase in the cost of living for the whole country during the same year—15 to 20 per cent.

The great disparity in the index numbers of the cost of living and the union wage rate of the building trades (with 1914 as a base) is due to the fact that in the years 1914, 1915, and 1916 there had been practically no change in the wage rate. Even the year 1917 saw but a slight revision upward. Workmen in some other groups, particularly in the metals group, had their wages considerably increased before 1917 because of the tremendous demand for war materials by the entente allies even before America entered the war.

It must be emphasized again that the index number of wage rates in 1918 is not for many building craftsmen the index number of their earnings for 1918 and that hence a comparison of the index number of the wage rate with that of the cost of living is not always fair. There is, however, in spite of this consideration, one not unimportant justification for the use of the 1918 index number of wage rates both alone and in comparison with that of the cost of living. In the discussion of a new wage rate for 1919, constant reference is made to the wage rate of 1918. That wage rate is projected into the year 1919, a post bellum year, in which normal conditions are expected to prevail. Its sufficiency or insufficiency is determined more or less by a consideration of the purchasing power of that 1918 wage rate in 1919. Hence a comparison of the index number of the wage rate of 1918 with that of the cost of living—though partially to be rejected as picturing inaccurately the conditions of 1918—has its value.

THE WAGE RATE OF 1919.

In the light of these arguments, the following interpretations of the wage rate of 1919 are possible:

1. Those building craftsmen whose earnings were considerably above those indicated by the index number of their wage rate and who have asked for an increase in their wage rate for 1919, have not necessarily asked for an increase over their earnings for 1918. They have asked in many instances for a wage rate based upon the rates they were actually paid in 1918 (or upon their total earnings).

2. If those same craftsmen have agreed to the 1918 wage rate for 1919, their earnings in 1919 are likely to be considerably less than their earnings were in 1918. In other words, they have accepted a reduction in their earnings.

3. Building craftsmen for whom the war did not change the prewar conditions with respect to overtime, continuity of employment, etc., and who find the purchasing power of the 1918 wage rate greatly

decreased as compared with that of prewar years, may have asked for a new wage rate that shall provide only for a better adjustment of their earnings to the increased cost of living.

EFFICIENCY OF THE BUILDING TRADES.

As an inevitable result of war conditions, the efficiency of building craftsmen suffered. Overtime and general abnormal conditions of employment produced their natural results. A great deal of skilled labor in the building trades was diverted to other fields and its place was taken by less efficient labor. Inefficient common labor was brought into the building industry. Labor turnover, too, was high. How much efficiency was reduced and how widespread the reduction was it is difficult to say, for statistics on labor costs are available in only small numbers, but toward the end of the war reduced efficiency was apparently making itself felt more and more.

That this reduced efficiency, however, is looked upon as a natural result of war conditions and will not apply in post-war times is shown by the fact that only 74 questionnaires on deferred building projects out of 6,472 returned to the Division of Public Works and Construction Development mentioned inefficiency of labor as a deterrent factor in the building program for 1919. This feeling is supported by the actual facts taken from a study of labor costs which were made by Mr. Morton Chase Tuttle, who served as a production manager for the United States Emergency Fleet Corporation. His analysis of his findings is particularly pertinent at this time and deserves to be quoted:

That a reduced wage scale is not an indispensable preliminary to resumption of activities in the building trades is the opinion of Mr. Morton Chase Tuttle, who has just returned to Boston, after more than a year of service as production manager for the United States Emergency Fleet Corporation. Mr. Tuttle bases his judgment on recent investigations of large construction enterprises from New England to Florida, supplemented by studies carried out under his direction by a construction company in Boston, of which he is general manager. This indicated that increased efficiency of labor is bringing down costs even while wages remain at existing altitudes.

"In the course of viewing numerous undertakings more or less closely associated with the interests of the Government," says Mr. Tuttle, "I have been lately impressed to find the statement commonly made that cost of operation was beginning to show a noticeable decline. And this almost without exception was attributed to increased efficiency of the labor force, due in part to the opportunity for weeding out the less dependable workers, in part to the growing desire of all members of the force to retain their jobs.

"*Cost studies.*—Owing to inadequate or otherwise unsatisfactory cost studies maintained in connection with most of these undertakings, I found it impossible fully to check the statement by actual figures. Accordingly, I asked my own company to make out the costs of any one process in an operation continued over a period of several weeks. That which was selected was a piece of concrete work. The costs studied were those for the common labor employed on this work from January 7 to February

4 of the present year (1919), inclusive. During this period the wage scale remained unaltered, but the personnel of the labor force underwent frequent changes.

"A graph of the labor cost of the work during the period noted shows a sharp and almost undeviating decline from day to day. On February 4 these costs were exactly 30 per cent less per unit than were those of January 7. It is my belief that the experience of my company is by no means isolated, and that in almost any labor-force there lies the opportunity of realizing economies ranging from 20 to 50 per cent without interfering with the wage scale.

"*Potent factor.*—This implies, of course, that there is now increased opportunity for selecting men according to their suitability for a given task and an increased eagerness on the part of the men to make good. The whole country ought soon to feel the effect of it in general improvement. It is a case of supplanting so-called liquidation of labor by proper adaptation of labor as a means of keeping the cost of doing things within the bounds of utility.

"State of mind is often as potent a factor in ultimate labor cost as is the rate per hour. Any one experienced in handling workmen has recognized the difference in output between a cheerful, capable man, anxious to hold his place, and one who is a little disgruntled and quite conscious that he can get another job the moment he drops the present one. Multiply either case by thousands of individual instances, and I believe that there will be found, in shifts of mental attitude, the explanation of much of the variation which occurs in unit cost. And this, after all, is the element of labor which directly affects the profits of the employer."

Conclusions: In the light of Mr. Tuttle's conclusions, which are borne out by the experience of the Housing Corporation and by other governmental builders, as well as by private builders, it may be said that the efficiency of labor for 1919 will, other factors remaining the same, tend toward that of labor in its normal years.

TABLE 81.—*Average weekly earnings in New York State factories.*

[Includes all employees in both office and shop.]

Industry.	1918	1914	Per cent increase.
Stone, clay, and glass products	$25.30	$13.94	81.4
Miscellaneous stone and mineral products	26.35	18.47	42.6
Lime, cement, and plaster	27.32	13.38	104.1
Brick, tile, and pottery	21.81	11.72	86.6
Glass	25.27	14.23	77.5
Metals, machinery, and conveyances	27.39	14.24	92.3
Gold, silver, and precious stones	26.52	14.24	86.1
Brass, copper, aluminum, etc.	25.45	12.73	99.9
Pig iron and rolling-mill products	37.97	16.63	129.2
Structural and architectural iron work	30.21	15.31	97.3
Sheet-metal work and hardware	22.44	12.20	83.9
Firearms, tools, and cutlery	24.11	13.11	83.9
Cooking, heating, and ventilating apparatus	27.47	13.87	98.0
Machinery, including electrical apparatus	25.32	13.96	80.6
Automobiles, carriages, and aeroplanes	26.55	18.07	46.9
Cars, locomotives, and railway repair shops	34.07	14.34	137.5
Boat and ship building	32.01	16.16	98.0
Instruments and appliances	21.25	13.40	58.5
Wood manufactures	20.97	12.50	67.7
Sawmill and planing-mill products	21.11	12.06	75.0
Furniture and cabinetwork	20.91	12.73	64.2
Pianos, organs, and other musical instruments	22.53	14.29	57.6
Miscellaneous wood and allied products	19.52	10.81	80.5
Furs, leather, and rubber goods	22.19	11.88	86.8
Leather	22.57	11.04	104.4
Furs and fur goods	29.80	14.33	110.8
Boots and shoes	23.46	12.52	87.3
Miscellaneous leather and canvas goods	18.55	10.99	68.6
Rubber and gutta-percha goods	19.91	10.93	82.1
Pearl, horn, bone, celluloid, hair, etc.	17.86	9.62	85.6
Chemicals, oils, paints, etc.	21.81	13.64	69.8
Drugs and chemicals	19.97	14.57	37.0
Paints, dyes, and colors	21.66	14.43	50.1
Animal and mineral oil products	22.91	13.35	71.6
Miscellaneous chemical products	21.89	13.17	66.1
Paper	25.65	13.49	90.1
Printing and paper goods	22.69	15.16	49.6
Paper boxes and tubes	17.62	10.59	63.5
Miscellaneous paper goods	18.38	11.75	56.4
Printing and book making	24.66	17.03	44.8
Textiles	17.21	9.47	67.5
Silk and silk goods	15.50	9.20	68.4
Wool manufactures	17.61	9.89	78.0
Cotton goods	19.44	9.61	102.2
Cotton and woolen hosiery and knit goods	16.26	8.98	82.5
Other textiles and allied products	18.93	10.20	85.5
Clothing, millinery, laundering, etc.	16.45	10.00	64.5
Men's clothing	18.77	11.02	61.2
Men's shirts and furnishings	13.13	8.51	54.2
Women's clothing	20.16	12.62	59.7
Women's underwear and furnishings	14.43	8.18	76.4
Women's headwear	19.18	10.92	75.6
Miscellaneous sewing	12.89	8.36	54.1
Laundering, cleaning, dyeing, etc.	14.96	8.86	68.8
Food, liquors, and tobacco	20.25	11.72	72.7
Flour, feed, and other cereal products	24.71	15.10	63.6
Fruit, and vegetable canning and preserving	17.54	9.62	82.3
Groceries not elsewhere classified	21.92	13.20	66.0
Slaughtering, meat packing, and dairy products	26.41	14.88	77.4
Bread and other bakery products	21.48	11.19	91.9
Confectionery and ice cream	14.94	9.64	54.9
Beverages	27.19	18.58	40.3
Cigars and other tobacco products	16.30	8.96	81.9
Water, light, and power	26.89	15.48	73.0
General average	23.18	12.56	84.5

TABLE 82.—*Average annual union wage scales, building trades, on per hour basis, 1913–1918, inclusive.*

[All figures as of May 15 of each year in a minimum of 10 cities in all parts of the United States. Compiled by L. F. Summerall, statistician, Ordnance Salvage Board, War Department.]

Building trades.	1913	1914	1915	1916	1917	1918
Bricklayers	$0.6647	$0.6759	$0.6590	$0.7005	$0.7303	$0.8052
Building laborers	.3104	.3125	.3512	.3579	.3700	.4709
Carpenters	.5040	.5104	.5070	.5406	.5707	.6760
Cement finishers	.5706	.5736	.4165	.6039	.6436	.7381
Cement finishers' helpers	.3955	.3983	.3362	.4291	.5187	.6250
Cement laborers	.3785	.3785	.4000	.3982	.4376	.5600
Composition roofers	.....	.....	.3573	.4818	.5083	.6203
Composition roofers' helpers	.....	.....	.2865	.3730	.3938	.4526
Engineers: Portable and hoisting	.6023	.6101	.5750	.6128	.6512	.7682
Hod carriers	.3571	.3663	.3363	.3863	.4265	.5319
Inside wiremen	.5136	.5281	.5050	.5553	.5765	.7118
Lathers	.5653	.5793	.5580	.5881	.6298	.7129
Painters	.4744	.4761	.4657	.4963	.5321	.6289
Plasterers	.6581	.6678	.6582	.6867	.7169	.8023
Plasterers' laborers	.4150	.4256	.3935	.4321	.4674	.5527
Plumbers and gas fitters	.5992	.6055	.5628	.6170	.6431	.7645
Sheet-metal workers	.4616	.4719	.4341	.4554	.4946	.6667
Steam fitters	.5955	.6034	.5781	.6117	.6428	.7507
Steam fitters' helpers	.3003	.3104	.3076	.3286	.3548	.4326
Stonemasons	.6069	.6198	.6267	.6653	.7033	.7768
Structural-iron workers	.5972	.6103	.6145	.6260	.6574	.7858
Structural-iron workers: Finishers	.5994	.6175	.6216	.6354	.6599	.7879
Structural-iron workers: Finishers' helpers	.3952	.4005	.3753	.3984	.4138	.5215
Annual average all above trades	.5030	.5115	.4750	.5208	.5540	.6584

Sources: U. S. Department of Labor and American Federation of Labor.

NOTE.—The introduction in 1915 of the wage scales of the composition roofers and helpers lowers the averages for 1915–1918 slightly.

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918.*

ATLANTA, GA.

[Average increase, 47.4 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate.		
	1914	1918	Per cent increase.		1914	1918	Per cent increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	45.0	70.0	55	Painters	33.3	50.0	50
Building laborers	20.0	.....	.....	Plasterers	45.0	.....	.....
Carpenters	40.0	60.0	50	Plumbers and gas fitters	44.4	68.8	55
Engineers (portable and hoisting):				Sheet-metal workers	33.3	65.0	95
Boom derrick	62.5	62.5	.....	Steam fitters	44.4	68.8	55
Hoist	45.0	62.5	39	Stonemasons	45.0	70.0	55
Hod carriers	28.1	.....	.....	Structural-iron workers	62.5	75.0	20
Inside wiremen	.....	55.0	.....	Structural-iron workers (finishers)	62.5	.....	.....
Marble setters	68.8	70.0	1				

BALTIMORE, MD.

[Average increase, 49 per cent.]

Bricklayers	62.5	100.0	60	Plumbers and gas fitters	50.0	75.0	50
Building laborers	20.0	.....	.....	Sheet-metal workers	40.0	62.5	56
Carpenters	43.8	70.0	60	Steam fitters	50.0	68.8	38
Engineers (portable and hoisting): Boom derrick	62.5	80.0	28	Steam fitters' helpers	28.1	43.8	56
Hod carriers	31.3	56.3	80	Stonemasons	56.3	75.0	33
Inside wiremen	43.8	70.0	60	Structural-iron workers	56.3	87.5	55
Marble setters	62.5	75.0	20	Structural-iron workers (finishers)	56.3	87.5	55
Painters	37.5	68.8	83	Tile layers	50.0	65.0	30
Plasterers	62.5	75.0	20				

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918*—Continued.

BIRMINGHAM, ALA.

[Average increase, 26.7 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate.		
	1914	1918	Per cent increase.		1914	1918	Per cent increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	70.0	87.5	25	Painters (sign)	56.3	75.0	33
Carpenters	45.0	65.0	44	Plasterers	62.5	75.0	25
Cement workers (finishers)	50.0	75.0	50	Plasterers' laborers	30.0	37.5	23
Engineers (portable and hoisting):				Plumbers and gas fitters	68.8	87.5	27
Boom derrick	62.5	70.0	12	Sheet-metal workers	55.0	65.0	18
Hoist	56.3	62.5	11	Steam fitters	68.8	87.5	27
Hod carriers	30.0	37.5	25	Stonemasons	70.0	87.5	25
Inside wiremen	62.5	75.0	20	Structural-iron workers	62.5	.....	.....
Marble setters	.....	87.5	.....	Structural-iron workers (finishers)	.....	.....	.....
Painters	45.0	62.5	39				

BOSTON, MASS.

[Average increase, 29.2 per cent.]

Bricklayers	65.0	80.0	23	Plasterers	65.0	80.0	23
Building laborers	35.0	40.0	14	Plasterers' laborers	40.0	60.0	50
Carpenters	55.0	75.0	36	Plumbers and gas fitters	65.0	75.0	15
Cement workers (finishers)	62.5	75.0	20	Sheet-metal workers	55.0	70.0	27
Engineers (portable and hoisting)	62.5	75.0	20	Steam fitters	50.0	75.0	50
Hod carriers	35.0	42.5	21	Steam fitters' helpers	28.1	50.0	78
Inside wiremen	55.0	70.0	27	Stonemasons	65.0	80.0	23
Marble setters	56.3	75.0	33	Structural-iron workers	62.5	80.0	28
Marble setters' helpers	30.0	42.5	42	Structural-iron workers (finishers)	62.5	80.0	28
Painters	55.0	75.0	36	Tile layers	68.8	80.0	16
Painters (sign)	62.5	68.8	10	Tile layers' helpers	.....	43.8	.....

BUFFALO, N. Y.

[Average increase, 26 per cent.]

Bricklayers	65.0	75.0	15	Plasterers	60.0	70.0	17
Building laborers	.....	45.0	.....	Plumbers and gas fitters	56.3	68.8	22
Carpenters	50.0	70.0	40	Sheet-metal workers	50.0	62.5	25
Cement workers (finishers)	.....	65.0	.....	Steam fitters	56.3	68.8	22
Engineers (portable and hoisting)	56.3	68.8	22	Steam fitters' helpers	.....	34.4	.....
Inside wiremen	47.5	70.0	47	Stonemasons	65.0	75.0	36
Marble setters	62.5	75.0	20	Structural-iron workers	62.5	85.0	36
Painters	46.9	56.3	20	Structural-iron workers (finishers)	62.5	85.0	36
Painters (sign)	.....	75.0	.....	Tile layers	56.3	62.5	11

CHARLESTON, S. C.

[Average increase, 47.4 per cent.

Bricklayers	40.0	50.6	26	Painters (sign)	50.0	.....	.....
Carpenters	33.3	50.0	50	Plasterers	40.0	50.6	26
Inside wiremen	33.3	57.0	71	Plumbers and gas fitters	43.8	73.0	67
Painters	25.0	31.3	25	Steam fitters	43.8	73.0	67

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918*—Continued.

CHICAGO, ILL.

[Average increase, 13.6 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate.		
	1914	1918	Per cent increase.		1914	1918	Per cent increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	75.0	81.3	8	Plasterers	75.0	87.5	17
Building laborers	57.5	70.0	22	Plasterers' laborers	50.0	56.3	13
Carpenters	65.0	80.0	23	Plumbers and gas fitters	75.0	81.3	8
Cement workers (finishers)	65.0	75.0	15	Sheet-metal workers	68.8	75.0	9
Engineers (portable and hoisting)	75.0	87.5	17	Steam fitters	75.0	85.0	13
Hod carriers	40.0	50.0	25	Steam fitters' helpers	40.0	45.0	12
Inside wiremen	75.0	81.3	8	Stonemasons	75.0	81.3	8
Marble setters	71.9	75.0	4	Structural-iron workers	68.0	87.5	29
Marble setters' helpers	42.5	50.0	18	Structural-iron workers' helpers	.....	80.0	.....
Painters	70.0	75.0	7	Tile layers	75.0	81.3	8
Painters (sign)	75.0	81.3	8	Tile layers' helpers	43.8	50.0	14

CINCINNATI, OHIO.

[Average increase, 20.2 per cent.]

Bricklayers	65.0	90.0	38	Plasterers	75.0	75.0	.....
Building laborers	25.0	35.0	40	Plasterers' laborers	45.0	50.0	11
Carpenters	50.0	65.0	30	Plumbers and gas fitters	61.8	65.6	7
Cement workers (finishers)	50.0	75.0	50	Sheet-metal workers	45.0	52.5	17
Engineers (portable and holsting)	55.6	60.0	8	Steam fitters	60.0	65.5	9
Hod carriers	42.5	50.0	18	Steam fitters' helpers	.....	33.5	.....
Inside wiremen	50.0	68.8	38	Stonemasons	60.0	70.0	17
Marble setters	68.8	75.0	9	Structural-iron workers	62.5	75.0	20
Marble setters' helpers	31.3	37.5	19	Structural-iron workers (finishers)	56.3	75.0	33
Painters	50.0	60.0	20	Tile layers	62.5	71.9	15
Painters (sign)	59.4	65.6	10	Tile layers' helpers	32.5	37.5	15

CLEVELAND, OHIO.

[Average increase, 38.6 per cent.]

Bricklayers	70.0	90.0	29	Painters (sign)	.....	75.0	.....
Building laborers	.....	55.0	.....	Plasterers	62.5	87.5	40
Carpenters	55.0	80.0	45	Plasterers' laborers	35.0	55.0	57
Cement workers (finishers)	55.0	80.0	45	Plumbers and gas fitters	62.5	90.0	44
Engineers (portable and hoisting):				Sheet-metal workers	45.0	80.0	78
Boom derrick	70.0	90.0	29	Steam fitters	62.5	81.3	30
Hoist	60.0	85.0	42	Steam fitters' helpers	31.3	43.8	40
Hod carriers	32.5	55.0	69	Stonemasons	70.0	90.0	29
Inside wiremen	60.0	81.3	36	Structural-iron workers	70.0	90.0	29
Marble setters	62.5	75.0	20	Structural-iron workers (finishers)	70.0	90.0	29
Marble setters' helpers	37.5	.....	.....	Tile layers	59.4	75.0	26
Painters	50.0	67.5	35	Tile layers' helpers	31.3	37.5	19

DALLAS, TEX.

[Average increase, 24.0 per cent.]

Bricklayers	87.5	87.5	.....	Plasterers' laborers	35.0	.....	.....
Carpenters	55.0	80.0	45	Plumbers and gas fitters	75.0	100.0	33
Cement workers (finishers)	62.5	75.0	20	Sheet-metal workers	56.3	75.0	33
Engineers (portable and hoisting)	62.5	87.5	40	Steam fitters	75.0	100.0	33
Inside wiremen	56.3	87.5	55	Steam fitters' helpers	.....	50.0	.....
Marble setters	68.8	68.8	.....	Stonemasons	87.5	87.5	.....
Painters	50.0	70.0	40	Structural-iron workers	62.5	75.0	20
Painters (sign)	62.5	75.0	20	Structural-iron workers (finishers)	.....	75.0	.....
Plasterers	87.5	100.0	14	Tile layers	70.0	75.0	7

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918*—Continued.

DENVER, COLO.

[Average increase, 32.9 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate.		
	1914	1918	Per cent increase.		1914	1918	Per cent increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	75.0	100.0	33	Plasterers	75.0	87.5	17
Building laborers	.....	53.1	.....	Plasterers' laborers	43.8	59.4	36
Carpenters	50.0	75.0	50	Plumbers and gas fitters	62.5	87.5	40
Cement workers (finishers)	62.5	75.0	20	Sheet-metal workers	56.3	75.0	33
Engineers (portable and hoisting)	62.5	81.3	30	Steam fitters	62.5	87.5	40
Hod carriers	40.6	56.3	39	Steam fitters' helpers	31.3	43.8	40
Inside wiremen	56.3	82.5	47	Stonemasons	62.5	87.5	40
Marble setters	68.8	75.0	9	Structural-iron workers	56.3	75.0	33
Marble setters' helpers	37.5	.....	.....	Structural-iron workers (finishers)	56.3	75.0	33
Painters	50.0	68.8	38	Tile layers	62.5	75.0	20
Painters (sign)	62.5	77.5	24	Tile layers' helpers	34.4	43.8	27

DETROIT, MICH.

[Average increase, 36.9 per cent.]

Bricklayers	65.0	80.0	23	Plasterers	68.8	75.0	9
Carpenters	50.0	70.0	40	Plasterers' laborers	43.0	50.0	16
Cement workers (finishers)	50.0	70.0	40	Plumbers and gas fitters	56.3	75.0	33
Engineers (portable and hoisting):				Sheet-metal workers	50.0	70.0	40
Boom derrick	65.0	100.0	54	Steam fitters	56.3	75.0	33
Hoist	62.5	75.0	20	Steam fitters' helpers	25.0	45.0	80
Hod carriers	35.0	56.3	61	Stonemasons	65.0	80.0	23
Inside wiremen	50.0	75.0	50	Structural-iron workers	65.0	80.0	23
Marble setters	62.5	75.0	20	Structural-iron workers (finishers)	65.0	80.0	23
Marble setters' helpers	34.4	.....	.....	Tile layers	50.0	71.9	44
Painters	45.0	70.0	56	Tile layers' helpers	25.0	.....	.....
Painters (sign)	50.0	75.0	50				

FALL RIVER, MASS.

[Average increase, 40.7 per cent.]

Bricklayers	60.0	75.0	25	Plumbers and gas fitters	43.8	67.5	54
Carpenters	42.0	62.5	49	Steam fitters	.....	60.0	.....
Cement workers (finishers)	.....	75.0	.....	Steam fitters' helpers	.....	45.0	.....
Inside wiremen	37.5	60.0	60	Stonemasons	60.0	75.0	25
Painters	37.5	55.0	47	Structural-iron workers	.....	62.5	.....
Plasterers	60.0	75.0	25				

INDIANAPOLIS, IND.

[Average increase, 16.1 per cent.]

Bricklayers	75.0	85.0	13	Plasterers laborers	.....	50.0	.....
Carpenters	50.0	60.0	20	Plumbers and gas fitters	62.5	75.0	20
Cement workers (finishers)	55.0	62.5	14	Sheet-metal workers	50.0	60.0	20
Engineers (portable and hoisting)	65.0	72.5	12	Steam fitters	62.5	75.0	20
Hod carriers	42.5	50.0	18	Steam fitters' helpers	.....	37.5	.....
Inside wiremen	50.0	67.5	35	Stonemasons	70.0	85.0	21
Marble setters	68.8	75.0	9	Structural-iron workers	68.0	75.0	10
Painters	50.0	55.0	10	Structural-iron workers (finishers)	68.0	75.0	10
Painters (sign)	.....	62.5	.....	Tile layers	62.5	68.8	10
Plasterers	65.0	75.0	15	Tile layers' helpers	31.3	.....	.....

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918*—Continued.

JACKSONVILLE, FLA.

[Average increase, 40.3 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate		
	1914	1918	Per cent increase.		1914	1918	Per cent increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	62.5	75.0	10	Plumbers and gas fitters	62.5	75.0	20
Carpenters	37.5	55.0	47	Sheet-metal workers	37.5	68.0	81
Inside wiremen	45.0	75.0	67	Steam fitters	62.5	75.0	20
Painters	37.5	55.0	47	Stonemasons	62.5	.....	.....
Plasterers	62.5	75.0	20				

KANSAS CITY, MO.

[Average increase, 21.1 per cent.]

Bricklayers	75.0	87.5	17	Plasterers	75.0	87.5	17
Building laborers	30.0	47.5	58	Plasterers laborers	45.0	55.0	22
Carpenters	60.0	75.0	25	Plumbers and gas fitters	68.8	87.5	27
Cement workers (finishers)	65.0	75.0	15	Sheet-metal workers	60.0	67.5	13
Engineers (portable and hoisting)	70.0	81.3	16	Steam fitters	68.8	87.5	27
Hod carriers	37.5	55.0	47	Steam fitters' helpers	.....	43.8	.....
Inside wiremen	62.5	75.0	20	Stonemasons	62.5	75.0	20
Marble setters	68.8	75.0	9	Structural-iron workers	65.0	75.0	15
Marble setters' helpers	37.5	.....	.....	Structural-iron workers (finishers)	65.0	75.0	15
Painters	60.0	75.0	25	Tile layers	75.0	75.0	.....
Painters (sign)	70.0	81.3	16	Tile layers' helpers	.....	43.8	.....

LITTLE ROCK, ARK.

[Average increase, 33.5 per cent.]

Bricklayers	75.0	87.5	17	Painters	50.0	65.0	30
Building laborers	.....	35.0	.....	Plasterers	62.5	75.0	20
Carpenters	50.0	70.0	40	Plumbers and gas fitters	62.5	87.5	40
Cement workers (finishers)	55.6	75.0	35	Sheet-metal workers	52.5	75.0	43
Engineers (portable and hoisting)	50.0	50.0	.....	Steam fitters	62.5	87.5	40
Hod carriers	37.5	55.0	47	Stonemasons	62.5	87.5	40
Inside wiremen	50.0	75.0	50	Tile layers	.....	75.0	.....

LOS ANGELES, CAL.

[Average increase, 17.4 per cent.]

Bricklayers	75.0	75.0	.....	Plasterers	75.0	75.0	.....
Building laborers	34.4	43.8	27	Plasterers laborers	61.4	62.5	2
Carpenters	50.0	62.5	25	Plumbers and gas fitters	56.3	68.8	22
Engineers (portable and hoisting)	50.0	62.5	25	Sheet-metal workers	56.3	68.8	22
Hod carriers	40.6	50.0	23	Steam fitters	56.3	68.8	22
Inside wiremen	50.0	62.5	25	Stonemasons	62.5	.....	.....
Marble setters	68.8	.....	.....	Structural-iron workers	50.0	62.5	25
Marble setters' helpers	37.5	.....	.....	Structural-iron workers (finishers)	50.0	62.5	25
Painters	43.8	62.5	43	Tile layers	62.5	62.5	.....
Painters (sign)	62.5	68.8	10	Tile layers' helpers	34.4	34.4	.....

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918*—Continued.

LOUISVILLE, KY.

[Average increase, 27.8 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate.		
	1914	1918	Per cent increase.		1914	1918	Per cent increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	65.0	75.0	15	Plasterers' laborers	38.0	50.0	32
Building laborers	27.9	30.0	8	Plumbers and gas fitters	60.0	70.0	17
Engineers (portable and hoisting)	56.3	75.0	33	Sheet-metal workers	42.5	50.0	18
Hod carriers	38.0	50.0	32	Steam fitters	50.0	75.0	50
Inside wiremen	40.0	60.0	50	Steam fitters' helpers	25.0	37.5	50
Marble setters	.....	68.8	.....	Stonemasons	60.0	70.0	17
Painters	50.0	50.0	.....	Structural-iron workers	50.0	70.0	40
Painters (sign)	50.0	62.5	25	Structural-iron workers (finishers)	.....	75.0	.....
Plasterers	65.0	70.0	8	Tile layers	50.0	75.0	50

MANCHESTER, N. H.

[Average increase, 64.5 per cent.]

Bricklayers	60.0	75.0	25	Plasterers	50.0	75.0	50
Carpenters	40.0	60.0	50	Plumbers and gas fitters	31.3	70.0	124
Cement workers (finishers)	.....	75.0	.....	Sheet-metal workers	34.4	37.5	9
Inside wiremen	34.4	60.0	74	Steam fitters	31.3	70.0	124
Painters	31.3	50.0	60				

MEMPHIS, TENN.

[Average increase, 28.9 per cent.]

Bricklayers	75.0	87 5	17	Plasterers	75.0	87.5	17
Carpenters	50.0	65.0	30	Plumbers and gas fitters	62.5	81.3	30
Engineers (portable and hoisting)	65.0	65.0	.....	Sheet-metal workers	50.0	62.5	25
Hod carriers	30.0	50.0	67	Steam fitters	62.5	81.3	30
Inside wiremen	50.0	75.0	50	Steam fitters' helpers	31.3	40.6	30
Painters	52.5	62.5	19	Structural-iron workers	65.0	75.0	15
Painters (sign)	51.9	62.5	20	Tile layers	62.5	.....	.....

MILWAUKEE, WIS.

[Average increase, 21.7 per cent.]

Bricklayers	67.5	75.0	11	Plasterers' helpers	35.0	50.0	43
Carpenters	50.0	62.5	25	Plumbers and gas fitters	62.5	68.8	10
Cement workers (finishers)	45.0	65.0	44	Sheet-metal workers	45.0	60.0	33
Engineers (portable and hoisting)	62.5	80.0	28	Steam fitters	56.3	62.5	11
Hod carriers	35.0	50.0	43	Steam fitters' helpers	28.1	31.3	11
Inside wiremen	50.0	75.0	50	Stonemasons	67.5	75.0	11
Marble setters	68.8	75.0	9	Structural-iron workers	62.5	70.0	12
Marble setters' helpers	37.5	.....	.....	Structural-iron workers' helpers	62.5	70.0	12
Painters	55.0	60.0	9	Tile layers	62.5	71.9	15
Painters (sign)	62.5	68.8	10	Tile layers' helpers	34.4	43.8	26

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918*—Continued.

MINNEAPOLIS, MINN.

[Average increase, 20.5 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate.		
	1914	1918	Per cent increase.		1914	1918	Per cent increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	70.0	75.0	7	Plasterers' laborers	40.6	55.0	35
Carpenters	50.0	60.0	20	Plumbers and gas fitters	62.5	75.0	20
Cement workers (finishers)	50.0	65.0	30	Sheet-metal workers	50.0	56.3	13
Engineers (portable and hoisting)	50.0	65.0	30	Steam fitters	62.5	75.0	20
Inside wiremen	50.0	68.8	38	Steam fitters' helpers	31.3	40.0	28
Marble setters	62.5	71.9	15	Stonemasons	55.0	70.0	27
Marble setters' helpers	37.5	.....	.....	Structural-iron workers	62.5	75.0	20
Painters	50.0	62.5	25	Structural-iron workers (finishers)	62.5	75.0	20
Painters (sign)	56.3	65.0	15	Tile layers	62.5	68.8	10
Plasterers	70.0	75.0	7	Tile layers' helpers	31.3	37.5	19

NEWARK, N. J.

[Average increase, 26.4 per cent.]

Bricklayers	65.0	80.0	23	Plasterers' laborers	.....	50.0	.....
Carpenters	50.0	70.0	40	Plumbers and gas fitters	62.5	75.0	20
Cement workers (finishers)	.....	70.0	.....	Sheet-metal workers	60.0	75.0	25
Engineers (portable and hoisting)	69.3	81.3	17	Steam fitters	62.5	75.0	20
Hod carriers	35.0	50.0	43	Steam fitters' helpers	33.1	42.5	28
Inside wiremen	62.5	75.0	20	Stonemasons	65.0	80.0	23
Marble setters	68.8	75.0	9	Structural-iron workers	62.5	87.5	40
Marble setters' helpers	40.6	.....	.....	Structural-iron workers (finishers)	62.5	87.5	40
Painters	44.0	62.5	42	Tile layers	62.5	68.8	10
Plasterers	65.0	80.0	23	Tile layers' helpers	.....	40.6	.....

NEW HAVEN, CONN.

[Average increase, 26.4 per cent.]

Bricklayers	60.0	70.0	17	Plasterers	60.0	70.0	17
Carpenters	50.0	65.0	30	Plumbers and gas fitters	50.0	62.5	25
Cement workers (finishers)	.....	70.0	.....	Sheet-metal workers	47.7	59.1	24
Engineers (portable and hoisting)	54.5	75.0	38	Steam fitters	.....	62.5	.....
Inside wiremen	.....	69.0	.....	Stone masons	55.0	70.0	27
Marble setters	.....	70.0	.....	Structural-iron workers	62.5	80.0	28
Painters	40.9	53.1	30	Structural-iron workers (finishers)	62.5	80.0	28

NEW ORLEANS, LA.

[Average increase, 26.0 per cent.]

Bricklayers	62.5	75.0	20	Plasterers' laborers	22.5	28.3	26
Carpenters	40.0	54.0	35	Plumbers and gas fitters	56.3	68.8	22
Cement workers (finishers)	.....	.....	.....	Sheet-metal workers	40.0	68.8	72
Engineers (portable and hoisting)	50.0	65.0	30	Steam fitters	56.3	75.0	33
Inside wiremen	50.0	70.0	40	Stone masons	62.5	62.5	.....
Marble setters	62.5	75.0	20	Structural-iron workers	62.5	75.0	20
Painters	40.0	50.0	25	Structural-iron workers (finishers)	62.5	75.0	20
Plasterers	62.5	62.5	.....				

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918*—Continued.

NEW YORK, N. Y.

[Average increase, 21.6 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate.		
	1914	1918	Per cent increase.		1914	1918	Per cent increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	75.0	81.3	8	Plasterers	68.8	75.0	9
Building laborers	22.5	40.5	80	Plasterers' laborers	40.6	56.3	39
Carpenters	62.5	68.8	10	Plumbers and gas fitters	68.8	75.0	9
Cement workers (finishers)	62.5	70.0	12	Sheet-metal workers	62.5	70.0	12
Engineers (portable and hoisting): Foundation work	62.5	81.1	30	Steam fitters	68.8	75.0	9
				Steam fitters' helpers	37.5	42.5	13
				Stone masons	60.0	75.0	25
Hod carriers	37.5	50.0	33	Structural-iron workers	62.5	87.5	40
Inside wiremen	60.0	75.0	25	Structural-iron workers (finishers)	62.5	68.8	10
Marble setters	68.8	75.0	9				
Marble setter's helpers	40.6	43.8	8	Tile layers	68.8	75.0	9
Painters	50.0	70.0	40	Tile layers' helpers	.....	46.0	.....
Painters (sign)	.....	75.0	.....				

OMAHA, NEBR.

[Average increase, 24.5 per cent.]

Bricklayers	70.0	75.0	7	Plasterers	75.0	87.5	17
Building laborers	.....	50.0	.....	Plumbers and gas fitters	68.3	87.5	28
Carpenters	50.0	60.0	20	Sheet-metal workers	42.5	65.0	53
Cement workers (finishers)	55.0	75.0	36	Steam fitters	68.3	87.5	28
Engineers (portable and hoisting)	56.3	75.0	33	Steam fitters' helpers	.....	43.8	.....
				Stone masons	70.0	75.0	7
Hod carriers	.....	55.0	.....	Structural-iron workers	60.0	75.0	25
Inside wiremen	50.0	70.0	40	Structural-iron workers (finishers)	60.0	75.0	25
Marble setters	.....	68.8	.....				
Painters	50.0	62.5	25	Tile layers	68.8	71.9	5
Painters (sign)	55.0	75.0	36	Tile layers' helpers	37.5	40.0	7

PHILADELPHIA, PA.

[Average increase, 39.3 per cent.]

Bricklayers	65.0	80.0	23	Plasterers	62.5	75.0	20
Building laborers	.....	45.0	.....	Plasterers' laborers	43.8	50.0	14
Carpenters	55.0	70.0	27	Plumbers and gas fitters	50.0	75.0	50
Cement workers (finishers)	47.5	65.0	37	Sheet metal workers	50.0	70.0	40
Engineers (portable and hoisting)	56.3	75.0	33	Steam fitters	50.0	75.0	50
				Steam fitters' helpers	28.1	50.0	78
Hod carriers	35.0	60.0	71	Stonemasons	55.0	70.0	27
Inside wiremen	45.0	75.0	67	Structural-iron workers	60.0	92.5	54
Marble setters	68.8	75.0	9	Structural-iron workers (finishers)	60.0	92.5	54
Marble setters' helpers	.....	.....	.....				
Painters	42.5	60.0	41	Tile layers	62.5	70.0	12
Painters (sign)	.....	68.8	.....	Tile layers' helpers	.....	42.0	.....

PITTSBURGH, PA.

[Average increase, 32.8 per cent.]

Bricklayers	70.0	90.0	29	Plasterers	68.8	85.0	24
Building laborers	37.5	45.0	20	Plasterers' laborers	40.0	60.0	50
Carpenters	56.3	80.0	42	Plumbers and gas fitters	55.0	75.0	36
Cement workers (finishers)	50.0	75.0	50	Sheet metal workers	55.0	80.0	45
Engineers (portable and hoisting)	56.3	80.0	42	Steam fitters	62.5	80.0	28
				Steam fitters' helpers	37.5	50.0	33
Hod carriers	40.0	60.0	50	Stonemasons	55.0	65.0	18
Inside wiremen	57.5	75.0	30	Structural-iron workers	62.5	87.5	40
Marble setters	62.5	75.0	20	Structural-iron workers (finishers)	62.5	87.5	40
Marble setters' helpers	37.5	.....	.....				
Painters	56.3	67.5	20	Tile layers	62.5	67.5	8
Painters (sign)	.....	72.5	.....	Tile layers' helpers	.....	43.8	.....

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918*—Continued.

PORTLAND, OREG.

[Average increase, 35.6 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate.		
	1914	1918	Per cent increase.		1914	1918	Per cent increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	75.0	100.0	33	Plasterers	75.0	100.0	33
Building laborers	37.5	62.5	67	Palsterers' laborers	50.0	75.0	50
Carpenters	50.0	75.0	50	Plumbers and gas fitters	75.0	90.0	20
Cement workers (finishers)	50.0	62.5	25	Sheet-metal workers	56.3	82.5	47
Engineers (portable and hoisting)	62.5	87.5	40	Steam fitters	75.0	90.0	20
Hod carriers	50.0	75.0	50	Stonemasons	75.0	100.0	33
Inside wiremen	56.3	72.2	28	Structural-iron workers	62.5	87.5	40
Marble setters	68.8	75.0	9	Structural-iron workers (finishers)	62.5	87.5	40
Marble setters' helpers	37.5	.....	.....	Tile layers	68.8	81.3	18
Painters	50.0	70.0	40	Tile layers' helpers	40.6	56.3	39
Painters (sign)	62.5	81.3	30				

PROVIDENCE, R. I.

[Average increase, 29.8 per cent.]

Bricklayers	65.0	70.0	7	Plasterers' laborers	.....	50.0	.....
Building laborers	25.0	42.0	68	Plumbers and gas fitters	48.0	75.0	56
Carpenters	50.0	70.0	40	Sheet-metal workers	48.0	57.0	18
Cement workers (finishers)	50.0	62.5	25	Steam fitters	43.8	65.0	48
Engineers (portable and hoisting)	50.0	62.5	25	Stonemasons	65.0	70.0	7
Hod carriers	30.0	45.0	50	Structural iron workers	62.5	80.0	28
Inside wiremen	50.0	60.0	20	Structural-iron workers (finishers)	62.5	80.0	28
Painters	45.5	62.5	37	Tile layers	62.5	68.8	10
Plasterers	62.5	68.8	10	Tile layers' helpers	.....	37.5	.....

RICHMOND, VA.

[Average increase, 54.4 per cent.]

Bricklayers	65.0	75.0	15	Steam fitters	50.0	75.0	50
Carpenters	37.5	62.5	67	Structural-iron workers	56.3	80.0	43
Inside wiremen	43.8	75.0	71	Structural-iron workers (finishers)	56.3	80.0	42
Painters	30.6	60.0	96	Tile layers	50.0	.....	.....
Plumbers and gas fitters	50.0	75.0	50				
Sheet metal workers	.....	60.0	.....				

ST. LOUIS, MO.

[Average increase, 18.9 per cent.]

Bricklayers	75.0	85.0	13	Painters (sign)	68.8	75.0	9
Building laborers	25.0	50.0	100	Plasterers	75.0	87.5	17
Carpenters	62.5	70.0	12	Plasterers' laborers	56.3	62.5	11
Cement workers (finishers)	65.0	75.0	15	Plumbers and gas fitters	75.0	81.3	8
Engineers (portable and hoisting):				Sheet metal workers	60.0	75.0	25
One engine	75.0	87.5	17	Steam fitters	75.0	75.0	.....
Two engines	87.5	100.0	14	Steam fitters' helpers	37.5	43.8	17
Hod carriers	50.0	65.0	30	Stonemasons	70.0	70.0	.....
Inside wiremen	65.0	86.3	33	Structural-iron workers	65.0	80.0	23
Marble setters	68.8	75.0	9	Structural-iron workers (finishers)	65.0	80.0	23
Marble setters' helpers	37.5	40.0	7	Tile layers	68.8	75.0	9
Painters	60.0	75.0	25	Tile layers' helpers	37.5	43.8	17

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918*—Continued.

ST. PAUL, MINN.

[Average increase, 24.2 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate.		
	1914	1918	Per cent increase.		1914	1918	Per cent increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	70.0	75.0	7	Plasterers	62.5	75.0	20
Carpenters	50.0	60.0	20	Plumbers and gas fitters	62.5	75.0	20
Cement workers (finishers)	50.0	75.0	50	Sheet metal workers	50.0	65.0	30
Engineers (portable and hoisting)	55.5	67.5	22	Steam fitters	50.0	75.0	50
Hod carriers	.....	50.0	.....	Steam fitters' helpers	30.0	40.0	33
Inside wiremen	50.0	68.8	38	Stonemasons	65.0	75.0	15
Marble setters	62.5	75.0	20	Structural-iron workers	62.5	75.0	20
Marble setters' helpers	31.3	.....	.....	Structural-iron workers (finishers)	62.5	75.0	20
Painters	50.0	62.5	25	Tile layers	62.5	68.8	10
Painters (sign)	56.3	65.0	15	Tile layers' helpers	31.3	37.5	20

SALT LAKE CITY, UTAH.

[Averago increase, 23.2 per cent.]

Bricklayers	80.0	87.5	9	Plasterers' laborers	56.3	68.8	22
Carpenters	62.5	82.5	32	Plumbers and gas fitters	75.0	87.5	17
Cement workers (finishers)	62.5	75.0	20	Sheet metal workers	57.5	75.0	30
Engineers (portable and hoisting)	62.5	81.3	30	Steam fitters	75.0	87.5	17
Hod carriers	50.0	62.5	25	Stonemasons	62.5	62.5	.....
Inside wiremen	56.3	75.0	33	Structural-ironworkers	62.5	81.3	30
Marble setters	.....	75.0	.....	Structural-iron workers (finishers)	62.5	81.3	30
Painters	56.3	75.0	33	Tile layers	.....	75.0	.....
Painters (sign)	62.5	68.8	10	Tile layers' helpers	.....	40.6	.....
Plasterers	75.0	100.0	33				

SAN FRANCISCO, CALIF.

[Average increase, 23.2 per cent.]

Bricklayers	87.5	100.0	14	Plasterers	87.5	100.0	14
Building laborers	31.3	50.0	60	Plasterers' laborers	62.5	68.8	10
Carpenters	62.5	87.5	40	Plumbers and gas fitters	75.0	87.5	17
Cement workers (finishers)	75.0	87.5	17	Sheet metal workers	68.8	82.5	19
Engineers (portable and hoisting)	75.0	87.5	17	Steam fitters	75.0	87.5	17
Hod carriers	50.0	62.5	25	Steam fitters' helpers	37.5	.....	.....
Inside wiremen	62.5	75.0	20	Structural-iron workers	75.0	87.5	17
Marble setters	62.5	75.0	20	Structural-iron workers (finishers)	62.5	87.5	40
Marble setters' helpers	37.5	50.0	33	Tile layers	75.0	81.3	8
Painters	59.4	75.0	26	Tile layers' helpers	37.5	50.0	33
Painters (sign)	68.8	81.3	18				

SCRANTON, PA.

[Average increase, 39.6 per cent.]

Bricklayers	60.0	75.0	25	Plumbers and gas fitters	46.9	62.5	33
Building laborers	25.0	50.0	100	Sheet metal workers	46.9	62.5	33
Carpenters	47.5	60.0	26	Steam fitters	46.9	62.5	33
Engineers (portable and hoisting)	50.0	62.5	25	Steam fitters' helpers	25.0	43.8	75
Hod carriers	32.5	50.0	54	Stonemasons	50.0	75.0	50
Inside wiremen	46.9	62.5	33	Structural-iron workers	56.3	68.8	22
Marble setters	.....	68.8	.....	Structural-iron workers (finishers)	.....	68.8	.....
Painters	40.0	55.0	38	Tile layers	50.0	60.0	20
Plasterers	55.0	70.0	27	Tile layers' helpers	.....	31.3	.....
Plasterers' laborers	.....	50.0	.....				

TABLE 83.—*Percentage increase in hourly wage rate for building tradesmen in large American cities, 1914–1918*—Continued.

SEATTLE, WASH.

[Average increase, 37.0 per cent.]

Trades.	Hourly rate.			Trades.	Hourly rate.		
	1914	1918	Per cent increase.		1914	1918	Per cent. increase.
	Cents.	*Cents.*			*Cents.*	*Cents.*	
Bricklayers	75.0	100.0	33	Plasterers	75.0	100.0	33
Building laborers	37.5	56.3	50	Plasterers' laborers	50.0	75.0	50
Carpenters	56.3	82.5	47	Plumbers and gas fitters	75.0	100.0	33
Cement workers (finishers)	62.5	81.3	30	Sheet metal workers	62.5	82.5	32
Engineers (portable and hoisting)	62.5	87.5	40	Steam fitters	75.0	100.0	33
Hod carriers	43.8	62.5	42	Stonemasons	.....	100.0	.....
Inside wiremen	62.5	87.5	40	Structural-iron workers	62.5	87.5	40
Marble setters	62.5	75.0	20	Structural-iron workers (finishers)	62.5	87.5	40
Marble setters' helpers	37.5	56.3	50	Tile layers	68.8	81.3	18
Painters	56.3	75.0	33	Tile layers' helpers	.....	48.5	.....
Painters (sign)	62.5	87.5	40				

SPRINGFIELD, ILL.

Building laborers	.....	37.5	.....	Inside wiremen	55.0	.....	.....
Carpenters	55.0	.....	.....	Painters	50.0	.....	.....
Cement workers (finishers)	56.3	.....	.....	Steam fitters	66.3	.....	.....

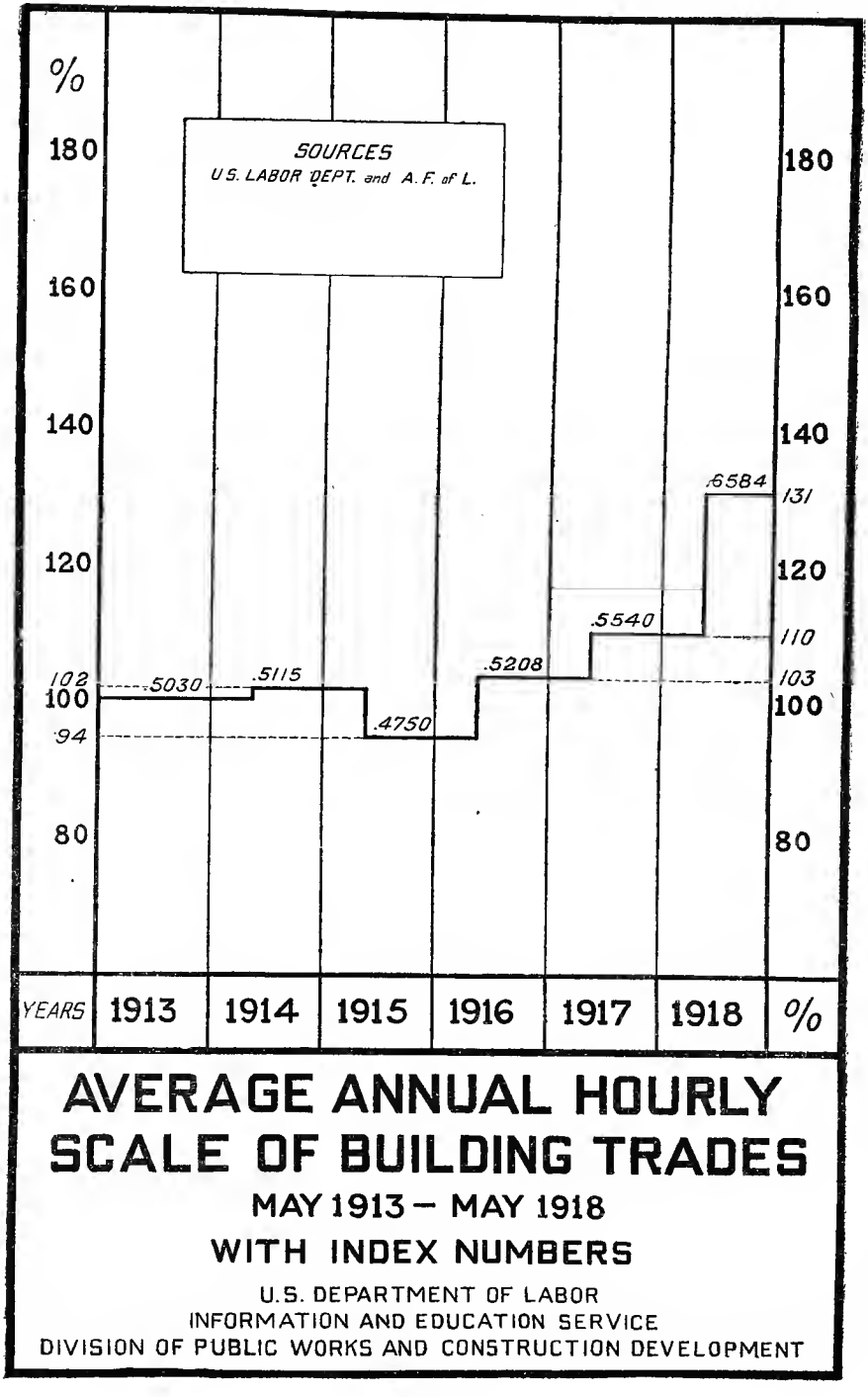
WASHINGTON, D. C.

[Average increase, 38.7 per cent.]

Bricklayers	66.7	75.0	12	Plumbers and gas fitters	56.3	75.0	33
Building laborers	25.0	50.0	100	Sheet metal workers	50.0	75.0	50
Carpenters	50.0	75.0	50	Steam fitters	55.0	75.0	36
Engineers (portable and hoisting)	62.5	80.0	28	Steam fitters' helpers	30.0	37.5	25
Inside wiremen	60.0	75.0	25	Stonemasons	66.7	87.5	31
Marble setters	62.5	75.0	20	Structural-iron workers	62.5	92.5	48
Painters	50.0	75.0	50	Structural-iron workers (finishers)	62.5	92.5	48
Plasterers	62.5	75.0	20	Tile layers	56.3	68.8	22
Plasterers' laborers	31.3	50.0	60	Tile layers' helpers	.....	37.5	.....

TABLE 84.—*Per cent increase of the wage rate of building trades, 1914–1918.*

City.	Per cent. increase.	City.	Per cent increase.
Atlanta, Ga	47.4	Memphis, Tenn	26.6
Baltimore, Md	48.7	Milwaukee, Wis	21.6
Birmingham, Ala	27.7	Minneapolis, Minn	20.8
Boston, Mass	29.8	Newark, N. J	26.3
Buffalo, N. Y	26.2	New Haven, Conn	25.9
Charleston, S. C	47.1	New Orleans, La	25.8
Chicago, Ill	13.3	New York, N. Y	20.7
Cincinnati, Ohio	18.2	Omaha, Nebr	24.2
Cleveland, Ohio	38.1	Philadelphia, Pa	39.6
Dallas, Tex	24.0	Pittsburgh, Pa	32.7
Denver, Colo	32.1	Portland, Oreg	35.3
Detroit, Mich	36.5	Providence, R. I	29.8
Fall River, Mass	40.4	Richmond, Va	54.0
Indianapolis, Ind	15.8	St. Louis, Mo	18.7
Jacksonville, Fla	39.8	St. Paul, Minn	24.0
Kansas City, Mo	21.0	Salt Lake City, Utah	23.0
Little Rock, Ark	33.0	San Francisco, Calif	22.9
Los Angeles, Calif	17.2	Scranton, Pa	39.4
Louisville, Ky	27.7	Seattle, Wash	37.0
Manchester, N. H	64.2	Washington, D. C	38.5



AVERAGE ANNUAL HOURLY SCALE OF BUILDING TRADES

MAY 1913 – MAY 1918

WITH INDEX NUMBERS

U.S. DEPARTMENT OF LABOR
INFORMATION AND EDUCATION SERVICE
DIVISION OF PUBLIC WORKS AND CONSTRUCTION DEVELOPMENT

CHART XIII.

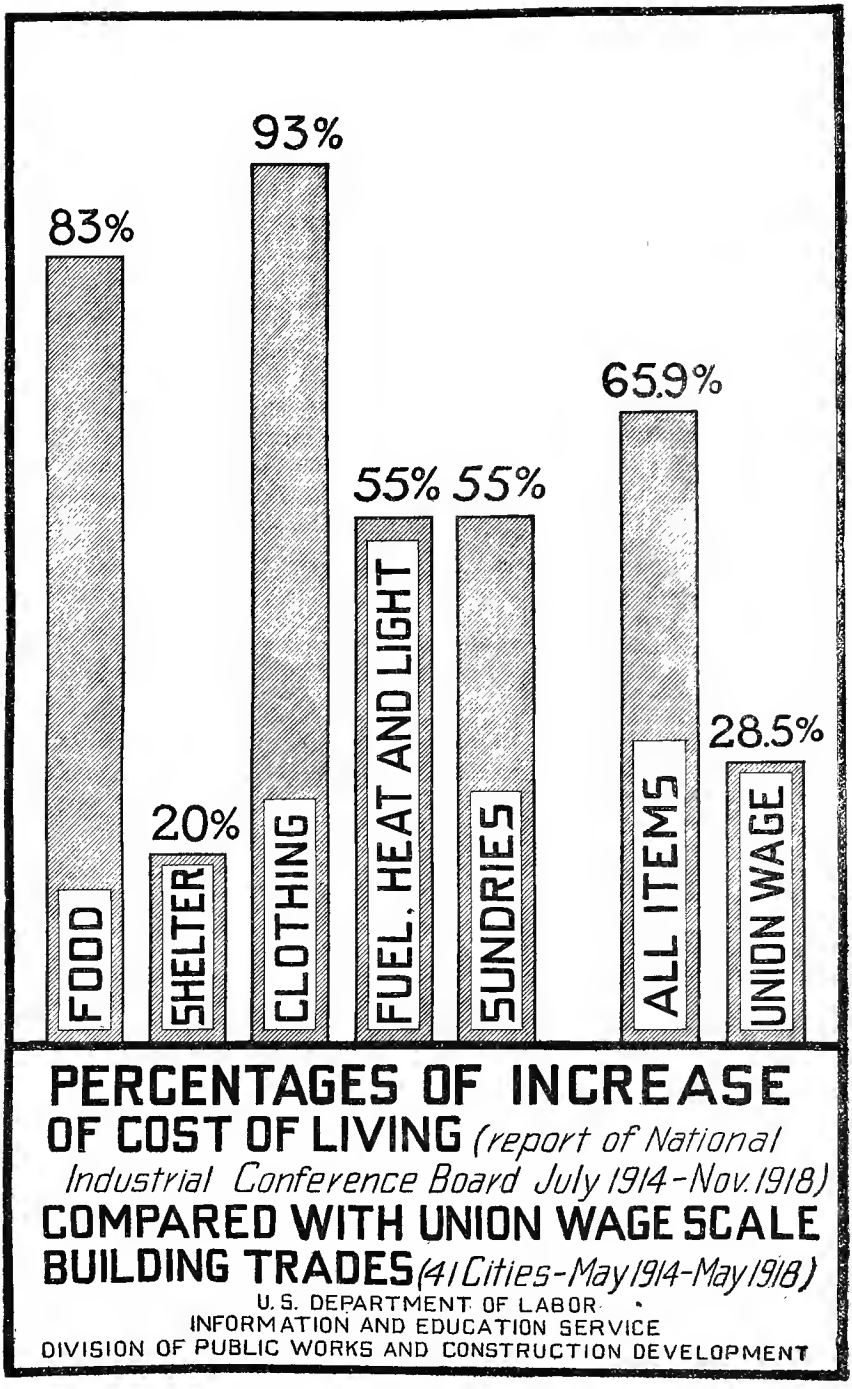

83%
FOOD
20%
SHELTER
93%
CLOTHING
55%
FUEL, HEAT AND LIGHT
55%
SUNDRIES
65.9%
ALL ITEMS
28.5%
UNION WAGE
PERCENTAGES OF INCREASE
OF COST OF LIVING (report of National Industrial Conference Board July 1914-Nov. 1918)
COMPARED WITH UNION WAGE SCALE
BUILDING TRADES (41 Cities-May 1914-May 1918)
U. S. DEPARTMENT OF LABOR
INFORMATION AND EDUCATION SERVICE
DIVISION OF PUBLIC WORKS AND CONSTRUCTION DEVELOPMENT

CHART XIV.

V. SOURCES AND SUPPLY OF CAPITAL FOR THE CONSTRUCTION INDUSTRY.

METHODS OF SUPPLY AND TERMS OF REAL ESTATE LOANS.

Temporary and permanent loans.

There are two principal methods of supplying capital to the building industry: The one of direct application may be termed the temporary method or building loan. The one of indirect application is the permanent or mortgage loan. The first method is peculiarly the basic principle of operation followed by the building and loan associations, and is resorted to by title insurance companies and by life insurance companies. For other financial institutions, the building loan, involving as it does much technical detail, is not a popular investment. Building loans under $100,000 are very commonly handled by building-loan operators as individuals. In further explanation of the method by which building loans are created, a quotation is given from a letter written by a member of the firm of Charles T. Wills (Inc.), of New York City:

> The business of making building loans requires a staff experienced in building construction and in the making of daily inspections of the work under construction. Only a few of the large insurance companies are so equipped; quite a few of the mortgage and title companies are so equipped. The large insurance companies—for example the Metropolitan—doing any building loan business accept only loans of this character of approximately $200,000 or over. The mortgage and title companies making building loans accept loans of approximately $100,000 and over. Loans under $100,000 are generally handled through building loan operators as individuals and sometimes under the name of a mortgage company; they do the financing either with their own funds or sometimes, where the loan is a large one they associate themselves with one of the mortgage and title companies, who underwrite a part of the loan, the building loan operators financing the balance themselves. Some of the large insurance companies and mortgage and title companies make what is known as a combination and permanent loan. This is principally done where the loan is a large one, as it saves the builder the expenses and fees of refinancing for the permanent loan. Small country homes are generally financed by building and loan associations and sometimes by local lawyers handling small funds.

Beyond the spheres already spoken of, only one other loan is found that sufficiently conforms to the nature of a building loan to warrant mention. We refer to the financial paper of producers of building materials and supplies which originates in direct relation to construction development. At times this type of paper undoubtedly forms a substantial investment in the portfolios of commercial banks of discount and deposit, for it is said that there was discrimination against it by the rediscount committees of the Federal Reserve banks

during the war period, when financial restrictions were imposed upon nonessential activities.

The permanent loan or mortgage investment, although of less direct application to the building industry, is of great importance because the volume of funds so invested has a controlling influence upon the prospects of the building industry. The reason is that no promoter, even though arrangements for a building loan were completely available, would venture to proceed upon construction development unless he had reasonable assurance that permanent accommodation also could be arranged for in advance with reasonable certainty.

Methods followed in making loans.

Bank methods.—The following methods are generally employed by banks when they invest in real estate loans: First, there is a formal written application made in detail by the intending borrower; second, there is an inspection of property by a representative of the lending institution. There is also a valuation made by a reputable appraiser and then there follows the annual inspection for the purpose of keeping track of the condition of the property, repairs, insurance, etc. The manner in which this inspection is carried out is for the most part governed by State laws; in some States it is required that two trustees make an inspection and in others it is specified that the inspection be made by the loan committee or the executive committee or such other part of the organization as is authorized by law to exercise this function.

Before there is any continuance or any extension of a loan contract there must be a reappraisal. Acceptance of the loan depends in part upon the bank's policy as regards its zone of operations and preferred neighborhood. Sometimes the policy of an institution will restrict it to the purchase of none other than guaranteed mortgages which will run as long as six years. Other institutions insist that the property title be guaranteed before they make any loan at all. In contrast to an institution that purchases only guaranteed mortgages there are those that will not purchase guaranteed mortgages, because they have their own facilities to determine whether the investment is likely to be satisfactory and amply secured. In these cases they prefer to give their depositors the benefit of full interest rates.

Title guaranty and trust company methods.—As a result of conferences with institutions of the title guaranty class this division is able to submit a tabulation of their general plan of procedure in the development of a market for a mortgage investment. A brief summary follows:

1. Investigation of owner's title.
2. Guaranty for stated charge if title is clear.
3. Appraisal of property value.

4. Actual investment in a mortgage on the property. (This step is considered as one operation and is not to be confused with the method followed by a commercial bank when it makes a loan against collateral security. In this case—of mortgage investment—the appraised value of the property apparently never appears as a book entry.)
5. Sale of the mortgage guaranteed by vendor to investor. Stated charge for guaranty is usually one-half of 1 per cent. It therefore follows that the investor is protected by—
   (*a*) Guaranteed title;
   (*b*) Margin of excess value;
   (*c*) Company's guaranty of the mortgage contract.
6. In case the amount is a very large one arrangements may be made to sell a participating interest in this mortgage investment to several separate investors. In this case, the steps already referred to are consummated in turn with an additional step, that the original investment is placed in the hands of a trustee appointed with the consent of the investor. It therefore follows that the investor's interest in common with the interests of his coinvestors is protected by—
   (*a*) Guaranteed title;
   (*b*) Excess margin of value;
   (*c*) Company's guaranty of the mortgage contract;
   (*d*) Intervention of a competent trustee chosen to enforce performance of legal technicalities according to the nature and terms of the participation and the mortgage. The point to be observed in all this procedure is that the method is one of *resale*, not one of *rehypothecation*.

Obviously these institutions combine two most important functions: on the one hand, that of guarantor of title and mortgage; and on the other, that of a distributing medium which reaches out into those sources of financial capital to be drawn upon only by means of direct appeal to the private investor. It is to the private investor that the title and trust companies offer real estate debentures and real estate collateral trust bonds and it is due in a large measure to the contribution of the small investor who acquires a participating interest in large mortgages that these concerns can operate so successfully.

To indicate what an important part the feature of title guaranty plays in real estate development, attention is called to the following abstract from the Annual Report of the Federal Farm Loan Board for 1918, which states:

It was found in many States that the abstracting of titles to farm lands was practically an unknown business. The offices of an abstractor were usually performed by

a title searcher whose practice was to make for his client in each instance such search of the record as he deemed the case in hand to demand, and usually to report verbally thereon.

It was properly felt by the banks that they must have evidence of incontestable title.

Early in the present year a plan was worked out by which the leading surety companies of the country have united in writing bonds guaranteeing the interested banks from loss by reason of failure of title. This guarantee is based upon a search of the record for the period, the running of which, in the several States, vests title by possession, this period varying from 8 to 21 years. This bond is furnished at a cost of one-fourth of 1 per cent of the amount of the loan with a minimum charge of $2.50, which expense is borne by the borrower. It is found that this method reduces the cost of record search so much that the total expense to the borrower is much less than under the former system, while delays on account of title are largely eliminated and the security of the banks against failure of title is made absolute.

As this business is profitable to the surety companies, the question naturally arises, could not the banks, which would have no expense in that connection, insure the same safety at a less cost to borrowers by collecting even a smaller sum and placing the same in a title guaranty fund to cover loss by possible failure of title.

Building and loan association methods.—Operating methods of building and loan associations have enabled them in some cases to go through 38 years of business experience without losing a dollar. The resources of the building and loan association consist of the stock subscription of its members and the moneys left with it by depositors who use it as a savings bank. A man applying for a loan subscribes for stock equal to the loan which he desires to receive. He is then obligated to pay for his stock at a weekly rate per share. This method of installment payment upon shares really represents a method of installment payment of the mortgage loan. There are various procedures followed in respect to the method of issuing shares. The principal plans are still known as the terminating, serial, or continuous plan.

Loans are made to subscribers in the order of their application, there being always a long waiting list. Before the loan is made the lot where construction is to take place and the type of building must be made known to the association and approved. If the subscriber owns his land, he may immediately obtain a loan of two-thirds of the combined value of land and building, provided there are funds available to lend him. If the subscriber does not own the land, he can not obtain his loan until his share payments have created an equity equal to one-third of the value of his future home. Sometimes he is able to build even earlier than this date, because he gets a contractor to take a second mortgage on his prospective home, the first mortgage going to the building and loan association.

In general, then, a man who has small capital—and in some cases no capital at all, only an earning power—is enabled to build by the help of the building and loan association out of savings. The present limitation upon the effectiveness of these associations is the lack of

capital behind them. What they need is the mechanism for making liquid the real estate mortgages which are their assets—ability to rediscount them at a reasonable rate of interest.

Insurance company methods.—To a large extent insurance companies are able to deal direct with borrowers that apply for the use of investment funds for real estate purposes, and these companies therefore maintain in each important city included in their lending field one of their own property inspectors and representatives. However, there are also two classes of independent agencies through which these institutions deal. Some of these agencies submit applications received from private parties for proposed loans direct to an insurance company, so that in all cases where the security is satisfactory and the application is approved, the loans are made out by the lender to the borrower for the latter's direct account. Also, there is always a number of agencies that make loans to borrowers on their own account in much the same way that private building operators do, relying on their ability to sell this paper afterwards to insurance companies or other firms. In this way substantial lines of mortgage loans are accumulated for ultimate resale, sometimes by the local banks and at other times by proprietors and partnerships in this line of business. If, in the process of inspection and examination to which the insurance companies subject these mortgages, all these investments pass the standard requirements, the agency receives payment, and, thus provided with new resources, is able to continue the process by accumulating another line of mortgages. Whether the process be that of buying mortgages on commission or buying them outright for reassignment later, it is understood that under certain conditions any mortgage which is below the standard requirements may be returned to the agent for credit by the insurance company. This has been the practice with respect to farm loans, and, on the authority of recent correspondence with insurance companies, essentially the same practice is found in respect to loans on real estate other than farm properties. Large projects whether adjacent or comparatively remote are always of interest as security for building loans, unless the lending institutions are compelled by current conditions temporarily to refrain from offering their funds. In the case of smaller projects in remote cities, it has been possible at times for promoters to obtain reasonable assurance of funds from the big institutions in New York in such a way that they have been enabled to secure advance funds from their local banks, pending completion of the proposed building operations. In normal times this has been a method of procedure often resorted to, and will, of course, be successful so long as the borrower can rely on that other very important source of permanent capital supply, the mortgage loan.

Security required.

With respect to the security required by all classes of institutions which have been addressed, including building and loan associations, it may be stated that no loan in excess of 70 per cent of the value of the property upon which it is based has been reported. Replies to questionnaires which this division has sent out indicate that in some instances the percentage of the amount loaned to the value of the property has dropped from 60 per cent in 1913 to 50 per cent in 1919 and that the range of percentages of loans to value between one locality and another will differ as much as 30 per cent, running from 40 per cent to 70 per cent of the value. In addition to the fact that in some localities owing to certain local conditions the per cent has dropped to the figure indicated, it must be remembered that in other localities where they continue to quote a nominal percentage within the ranges of 50, 60, and 70 per cent loaned, the lenders admitted that they were valuing all new construction at a discount from the original cost, ranging all the way from 5 to 30 per cent, because of the higher cost of construction prevailing in 1919 as compared with previous years.

In connection with this summary of security required, it will be of interest to quote from a letter written by the president of a large savings bank:

> Replying to the second question as to what per cent of the value of property was the limit, this is purely and simply a hypothetical question which is determined by personal opinion or by the appraised value of property. While during our 30 years of experience it has been our endeavor to try to make them on what we consider a 50 per cent value of property of all descriptions (except that we do not loan on industrial plants), yet the true safety of a loan is that the loan must be small enough so that under foreclosure proceedings the debt would be collected. The varying conditions existing from time to time make an opinion placed at one time not such as would govern at other periods.
>
> As to the question of loans made in 1919, and what proportions we consider the value of new buildings, we endeavor to consider the value of new buildings on the basis of what they are worth through a period of years. There can be no fixed definite rule made as to the basis of a loan on property. The considerations entered into are so varying, both as to the location of property, the normal hazard connected therewith, the changing conditions arising from changes in values in different sections of the city, the character of the property and its location, that each case has to be taken up by itself and determined from its characteristics as existing.

Rate of interest.

The rate of interest on real estate loans varied in 1913 with the section of the country. In thickly settled regions the rate was as low as 4½ per cent, but was much higher in the West and South. In general, the rate ranged from 4½ per cent to 8 per cent in 1913. The most common rate was apparently 5 to 6 per cent. From 1913 to 1918 there appears to have been an increase of from one-half per cent to 1 per cent in rates the country over.

Duration of loans.

Late in November, 1918, the savings bank section of the American Bankers' Association began an extensive inquiry, both at home and abroad, into the lending methods of institutional investors in mortgages and real estate loans. The original feature of this study will be a careful analysis of an unpublished manuscript prepared abroad relating to the methods and practices followed in Germany and Austria up to 1914. The association also sent to England a special expert to investigate and report on the methods and practices developed there. As early as November 28, 1918, the association sent out a letter to a selected list of representative State banks, trust companies, and insurance concerns asking the following questions:

1. What is the method employed by you in making and caring for real estate loans?
2. For how long a term do you make mortgage loans and what is your practice when the loans mature?
3. Do you require any reduction of the principal during the life of the mortgage loans periodically or by call? If so, how and when? (I should appreciate copies of forms used in calling of loans or a portion thereof and a description of the method pursued.)
4. Do you require a reduction of the principal before renewing a mortgage loan?
5. Do you believe in the amortization of mortgage loans?

The secretary of the New York committee very kindly permitted an examination of all the correspondence which had been received in reply to the above questionnaire. Upon the basis of the interest and knowledge evidenced by this correspondence, the committee selected six mortgage leaders in each State to act as subcommittees through which to carry on the association's educational work in stimulating support for more scientific methods of caring for real estate loans.

By far the largest number of letters received by the American Bankers' Association indicated that three years was the usual time for a city real estate loan to run. Many of the institutions, however, showed that they were accustomed to grant loans for five years, but no loans for a period in excess of five years appeared to be granted on city property. Many letters, in stating the duration of loans to be one, three, and five years, contained the following characteristic comments:

One year and if security is satisfactory allowed to remain an open mortgage.

One year and allowed to run as a due mortgage subject to inspection and reappraisal.

One, three, five years; no longer than five years.

One year and continued indefinitely if interest and taxes are paid and property is kept in repair.

Limit six years, when buying is guaranteed.

Our mortgages are drawn for one to five years, but are not paid when due. We prefer to limit our loans to one year for the reason that we can immediately thereafter demand partial payment or an increase in rate at any time.

It is especially interesting to note the reply of one concern, which stated that it had ordinarily been accustomed to lend for three years, but *recently had reduced* its limit to one year. No reason was given.

The most surprising reply came from those institutions which reported that "all their loans were made payable one day after date so that all were on call and no renewals were ever made."

Terms of renewal.

Some concerns invariably insist upon reduction of principal before extending a loan. Others require reduction of principal only when the mortgage is not a very strong one; that is, if the property depreciates or the mortgage exceeds 60 per cent of the property value. In describing their so-called terms of renewal many of the concerns emphatically stated that it was their practice not to *renew;* that they allowed their loans to *run,* by *continuing* or *extending* them. These last two terms indicate that extension is an expedient for avoiding the expense of recording and other legal details that would accompany renewal. The following quotations relating to renewal of loans are characteristic:

"Do not renew loans; they really become demand after lapse of one year.

"Never pretend to collect mortgage so long as interest is paid."

"Seldom extend, unless mortgage is guaranteed at expiration."

A very good indication of the extent to which old-fashioned methods of real estate investments have produced stagnation is found in the following quotation taken from the letter of one of the large Hartford insurance companies:

> We do not favor loans on city properties, because the borrower has been falsely educated to think he has placed the mortgage in perpetuity.

Terms of principal reduction.

Only 18 per cent of the institutions addressed by the American Bankers' Association were not in favor of amortization. The most characteristic objection to amortization given may be indicated by the following quotation: "Mortgage loans that come within the classification of securities prescribed as legal investments for trustees are especially stable; sometimes the land value alone will equal the amount of the loan. For this reason there is no need in these cases of adopting an amortization schedule which would tend to annoy beneficiaries of estates with constant and recurring changes in security held for their benefit." In short, the objection seemed to be that trust companies do not wish to be incumbered with the additional detail of administration involved in amortization and therefore are inclined to plead it would cause inconvenience to their customers.

Characteristic remarks of bankers on the reduction of principal follow:

"Reduction is at discretion whenever possible without inconvenience to mortgagor, but no stated periods specified and no special form used."

"Each mortgage treated separately; no rules."

"Reduction required on one-year mortgage after it expires, if security is not satisfactory."

"Purchase money mortgage subject to reduction by semiannual payment."

"Require reductions annually or semiannually during the life of the mortgage, when surplus security is not fully satisfactory."

"No reduction on three-year dwelling house loans, but in case of large amounts on business or apartment property we generally require annual payment of principal by installment."

"No reduction necessary, as all our real estate loans are on demand with interest payable semiannually in advance." (Explanation: Due to Connecticut State laws.)

"We require annual payment of 5 to 10 per cent on account of principal." (Maine.)

Title insurance companies of New York.

Title insurance companies are described by Cyril H. Burdett in Real Estate Record and Guide of May 18, 1918, as great lending institutions and clearing houses at which the investor in mortgages on real estate is brought into contact with real estate owners desiring loans. Title insurance companies, with their affiliated mortgage guaranty companies, have outstanding in guaranteed mortgages at the present time over five hundred million dollars. Practically all loans made on real estate in New York City are made by either title insurance companies directly or by lenders who obtain policies of title insurance issued by these companies. The four large companies guaranteeing mortgages have under guaranty at the present time in New York City mortgages amounting to over four hundred and fifty million dollars. These mortgages have been made for periods of three years. (Frank Bailey, vice president of the Bond & Mortgage Guarantee Co., in Record and Guide, June 29, 1918.)

The following statement of the Lawyers' Mortgage Co., of 59 Liberty Street, New York, indicates the distribution of mortgages guaranteed by title insurance companies:

Outstanding mortgages of the Lawyers' Mortgage Co. as divided among the company's customers.

45 savings banks	$15,126,000
1,570 trustees	35,485,000
4,715 individuals	65,046,000
243 charitable institutions	12,267,000
16 insurance companies	6,919,000
28 trust companies	7,932,000
Total mortgages outstanding, Dec. 31, 1918	142,775,000
Total mortgages outstanding, July 1, 1918	144,683,000

It will be observed from the above table that individuals hold nearly one-half of all the mortgages guaranteed by this company. It might be noted also that the total amount of mortgages guaranteed by this company decreased nearly $2,000,000 from July 1, 1918, to December 31, 1918. The company stated that since August, 1914, it has paid off mortgages amounting to $55,657,000, or nearly 40 per cent of all outstanding mortgages.

The Torrens system in New York.

The efficacy of the Torrens land title system in reducing the cost of real estate loans has long been a subject of controversy. It has recently come more prominently into the public eye in New York. On May 9, 1918, Gov. Whitman signed the Torrens title bill, amending the law as it had been operating in New York. (Record and Guide, May 11, 1918.) Advocates of this law assert that it enables property owners in New York "to free themselves from the grip of title companies" and that every property owner will find it to his advantage to avail himself of the benefits of this law. Under the new law, it is asserted, the registration of land titles can be made at moderate expense and in a short period of time, unless there is a contested title.

Walter Fairchild, secretary of the Torrens Title League, outlines the methods of operating under this law as follows (Record and Guide, May 18, 1918):

For first registration, the title is examined under order of the court. This official examination is done by an examiner in the registrar's office although the court may, if applicant requests, accept a report from a title company in lieu of the official examiner's report. A survey must be furnished by the petitioner. The court sets a day when the petitions will be heard, and notices of the hearing are sent out by the registrar. On the return day, if no objections are found, the title is ordered registered, and assurance premium is then paid to the registrar and the owner receives a certificate of title. No appeal from the final order of the registrar can be taken after 30 days, when the title becomes conclusive.

The costs under the Torrens law, as compared with title insurance companies' costs, have been tabulated as follows by Edward Polak, registrar of the County of Bronx (Record and Guide, May 18, 1918):

Amount.	Original issues.		Reissues.	
	Title company fees.	Torrens fees.	Title company fees.	Torrens fees.
$5,000	$85.00	$41.00	$51.00	$3.00
10,000	115.00	51.00	69.00	3.00
25,000	205.00	81.00	123.00	3.00
50,000	320.00	131.00	189.50	3.00
75,000	382.50	181.00	220.75	3.00
100,000	445.00	231.00	252.00	3.00

(A detailed account of the official procedure under the Torrens law is given by James A. Donegan, registrar of New York County, in Record and Guide of June 1, 1918.)

The Torrens law is severely criticized by Cyril H. Burdett, vice president of the New York Title & Mortgage Co. The objection he raises is the inadequate equipment of the offices of the county clerks and registrars in New York City for making title researches. They must use the old methods of digging out the chain of title—a long and cumbersome procedure. In connection with the initial registration, Mr. Burdett says, the registrar will be required, in addition to making a search in his own office, to search in the county clerk's office, in the United States courts, in the offices of the tax collector, the comptroller, and the county treasurer. He will also have to make an inspection of the property to determine all existing easements. In connection with the title examination by a title insurance company, this constitutes a very important part of the service and makes up a considerable part of the expense. He asserts that taxpayers under the Torrens law will have to pay for this service. The great amount of detail involved in title examination makes it necessary to employ a large number of persons. The simplest title will require the work of a number of men many days to complete, and Mr. Burdett believes that the registration of a title under the Torrens system can not be accomplished in 30 days.

The New York law legalizing investments and certificates when they cover unencumbered real estate.

The Real Estate Record and Guide of May 11, 1918, states that the Gilchrist bill, providing that trust funds may be invested in parts of mortgages held by trust companies and title guaranty companies, was approved by Gov. Whitman. In addition to the investments now authorized by fiduciaries, they may invest in shares or parts of bonds and mortgages which themselves are authorized investments for trustees. The shares in which such investments are made are

not subordinate to any other shares and are not subject to any prior interest. The bond and mortgage and the insurance policies, guaranties of payment, and other instruments and evidences of title relating thereto shall be held for the benefit of the persons interested in the security by a trust company or title guaranty company organized under the laws of the State.

The experience of the title companies and mortgage guaranty companies shows that trustees have sought this form of investment in mortgages. It frequently happens that trust funds are not large enough to take an entire mortgage on large units, which are the safest because they affect the most modern buildings and best-constructed buildings. If trustees would make these investments, large sums of money would be available for mortgage investments which now are not so available.

SUPPLY OF CAPITAL FURNISHED BY EACH OF THE CHIEF LENDING INSTITUTIONS IN THE UNITED STATES.

Sources of real estate loans in 1913.

The following table shows the real estate loans of various classes of banks and of insurance companies and building and loan associations in 1913.

TABLE 85.—*Real estate loans.*

[In millions of dollars.]

	1913	Per cent of total.
Trust companies	576.3	9.3
Savings banks	2,303.7	37.3
State banks	555.6	9.0
National banks	76.8	1.3
Private banks	35.2	.6
Total banks, June 30	3,547.6	57.5
Insurance companies Jan. 1	1,485.1	24.1
Building and loan association assets Jan. 1	1,137.6	18.4
Grand total	6,170.3	100.0

It will be noted that of the total real estate loans shown in Table 85, amounting to $6,170,300,000, banks held 57.5 per cent; insurance companies held 24.1 per cent, and building and loan associations 18.4 per cent. Savings banks alone held 37.3 per cent, or more than either insurance companies or building and loan associations. In order of importance, savings banks rank first, insurance companies second, and building and loan associations third. Trust companies and State banks supplied approximately 9 per cent. National banks and private banks were practically of negligible importance.

Increase in real-estate loans by banks, 1913–1918.

In Table 86, based upon the annual reports of the Comptroller of the Currency, are shown loans secured by real estate (including mort-

gages owned) held by banks and trust companies in the United States in 1913, 1917, and 1918. In this table it was desired to get comparable statistics for those years. The totals as they stand in the comptroller's reports are not comparable because in 1913 the comptroller reported real estate loans by State banks in 46 States, by mutual savings banks in 17, by stock savings banks in 36, by private banks in 27, and by trust companies in 46, while in 1917 the comptroller reported real estate loans for State banks in only 19 States, for mutual savings banks in 13, for stock savings banks in 9, for private banks in 12, and for trust companies in 23. It is readily seen, therefore, that any conclusions which might be drawn by comparing the reports of the comptroller on real estate loans by all banks in the United States in 1913 with the totals he gives for real estate loans in 1917 would be erroneous.

To make these figures comparable, it is necessary to find for 1913 the total real estate loans by different classes of banks in only those States which are reported in 1917.

TABLE 86.—*Loans secured by real estate (including mortgages owned) held by banks and trust companies in the United States.*

1	2	3	4	5	6	7	8
	In all States reported in 1913.	In all States reported in 1917.	Per cent column 3 is of column 2.	In all States reported in 1917.	In all States reported in 1918.	Total for all States in 1917 on the assumption that column 5 represents 83 per cent of total.	Total for all States in 1918 on the assumption that column 6 represents 83 per cent of total.
	1913	*1913*		*1917*	*1918*		
National banks	$76,819,933	$76,819,933		$185,424,000	$185,117,000		
State banks	555,662,331	246,636,479		341,577,190	290,002,042		
Mutual savings banks	1,815,585,610	1,791,901,491		2,112,081,686	2,065,553,658		
Stock savings banks	488,159,896	307,340,896		387,312,979	26,485,117		
Private banks	35,172,653	25,587,541		17,878,873	14,725,888		
Trust companies	576,334,682	490,813,465		632,846,177	555,655,502		
Total	3,547,695,105	2,939,099,805	83	3,677,120,905	3,137,539,207	$4,430,266,151	$3,780,167,719

Source: Figures in columns 2, 3, 5, and 6 as given in annual reports of the Comptroller of the Currency.

In Table 86 the columns are numbered from 1 to 8, and in order to make the meaning of this table clear it is necessary to note here the significance of each of these columns.

In column 2, under the heading of all States reported in 1913 the total of real estate loans reported by the Comptroller of the Currency for the different classes of banks is given. It will be seen that this amounts in the aggregate to $3,547,695,105. This represents practically all the banks in the United States.

In column 3, under the heading States reported in 1917, is given the real estate loans reported in 1913 by the Comptroller of the Cur-

rency by the different classes of banks in only those States included in the comptroller's totals for 1917. In other words, the figures in column 3 for 1913 are comparable with the figures in column 5 for 1917, and do not represent the real estate loans of all banks.

In comparing the totals of column 3 with column 2, it was found that the former was 83 per cent of the latter as shown in column 4. In column 5 is given the total amount of real estate loans by different classes of banks as reported in 1917. As already stated, these totals represent real estate loans by the same class of banks in the same States as figures in column 3.

In column 6 are given the totals for real estate loans by the different classes of banks as reported by the comptroller in 1918. These totals were taken from Volume I of the comptroller's report, which does not indicate what States were included, Volume II, which would give this information, not having been printed at date of this writing. It is probable that the real estate loans reported in 1918 were for the same banks in the same States as for 1917 with one exception. That exception is in the case of stock savings banks, for the comptroller's report shows a decrease from $387,000,000 in 1917 to $26,000,000 in 1918. Such a large apparent decrease indicates that California, which reported $361,000,000 of real estate loans of stock savings banks in 1917 must have been dropped from the comptroller's report in 1918. In the case of other classes of banks there may also have been States omitted in 1918 which were not omitted in 1917; but this is not very likely to have been the case.

It has already been noted that the real estate loans held in 1913 by banks in those States which are included in the comptroller's 1917 report amount to only 83 per cent of the real estate loans held by all banks reported in 1913. The figure in column 7 was reached by the assumption that the total amount of real estate loans reported by the comptroller in 1917 amounted to the same percentage of total real estate loans held by banks in that year.

The figure in column 8 is reached by the assumption that the comptroller's report in 1918 reported 83 per cent of all real estate loans held by banks. In view of the fact already pointed out in regard to stock savings banks that the comptroller did not report all the banks in 1918 that were reported in 1917, the total amount shown in column 8 is probably too low.

To summarize what has been said in detail above:

The comptroller's report in 1917 reported real estate loans by different classes of banks in only part of the States. In these same States in 1913 he reports real estate loans for the different classes of banks amounting to only 83 per cent of the real estate loans reported for all banks in all States that year. Assuming that the real estate loans reported in 1917 were only 83 per cent of all real estate loans

held by banks in that year, we arrive at the total amount of real estate loans held by banks in 1917, $4,430,000,000.

On the same assumption that the comptroller in 1913 reported 83 per cent of the real estate loans held by different classes of banks in all States, we arrive at the figure $3,780,000,000 of real estate loans held ny all banks in 1918.

There is reason for thinking, however, that the real estate loans reported in 1918 represent less than 83 per cent of all real estate loans and that the actual amount of real estate loans held by banks in 1918 probably amounted to $4,100,000,000.

Increase in combined real estate loans of banks, insurance companies, and building and loan associations, 1913–1918.

Table 87 gives the real estate loans of banks, trust companies, and insurance companies and the total assets of building and loan associations in the United States for 1913, 1917, and 1918. In this table the results reached in Table 86 were utilized except for the year 1918. For 1918 the figure $4,100,000,000 was taken as representing the total real estate loans held by banks and trust companies. This figure is $320,000,000 larger than the figure reached on the assumption that the comptroller reported 83 per cent of all real estate loans held. This increase in the estimate is justified by the apparent fact that the California stock savings banks with real estate loans of $361,000,000 in 1917 were not included in the 1918 report of the comptroller.

The figures for insurance companies were taken from the Insurance Yearbook, published by the Spectator Co., and represent the amount of real estate loans held by insurance companies on January 1 of the years 1913, 1917, and 1918.

The statistics for building and loan associations were taken from the Proceedings of the Annual Convention of the United States League of Local Building and Loan Associations and represent the total assets of these institutions on January 1, 1913, 1917, and 1918.

By adding the loans of banks and insurance companies to the total assets of the building and loan associations, practically all of which represent real estate loans, a grand total in round numbers was reached of $6,170,000,000 in 1913, $7,921,000,000 in 1917, and $7,890,000,000 in 1918.

These figures show an increase in real estate loans held by these institutions of $1,751,000,000 in 1917 over the amount held in 1913, and an increase of $1,720,000,000 in 1918 over the figure for 1913. This represents an increase in both 1917 and 1918 of approximately 28 per cent over the figure for 1913.

TABLE 87.—*Real estate loans of banks, trust companies, and insurance companies and total assets of building and loan associations in the United States.*

	1913	1917	1918
Banks and trust companies, June 30	$3,547,695,105	$4,430,266,151	$4,100,000,000
Insurance companies, Jan. 1	1,485,108,814	1,892,607,916	2,020,873,663
Building and loan association assets, Jan. 1	1,137,600,648	1,598,628,136	1,769,142,175
Grand total	6,170,404,567	7,921,502,203	7,890,015,838
Increase over 1913		1,751,097,636	1,719,611,271
Increase over 1913.....per cent		28	28

Sources: Bank and trust company statistics derived from the comptroller's report; insurance statistics from Insurance Yearbook, published by the Spectator Co.; building and loan statistics from Proceedings of Annual Convention of the United States League of Local Building and Loan Associations.

Increase of real estate loans compared with various indices of national expansion.

It is interesting to compare the increase in real estate loans held by the chief lending institutions with various indices of national expansion as shown in Table 88.

TABLE 88.—*Increase in the real estate loans as compared with various indices of national expansion.*

[In millions of dollars.]

	Amount in 1913.	Amount in 1918.	Percentage increase from 1913 to 1918.
			Per cent.
Combined real estate loans of banks, insurance companies, and building and loan associations	6,171	7,890	28
Bank loans secured by real estate collateral	3,548	4,100	16
Bank loans secured by collateral other than real estate	4,513	5,850	30
Total loans and discounts of banks in the United States	14,657	22,575	54
Individual bank deposits in the United States	17,476	27,808	59
Stocks and bonds owned by banks and insurance companies	7,362	12,362	68
Dr. Friday's estimate of national income of the United States	34,500	45,000 (1917)	30
Dr. Friday's estimate of savings in the United States	6,000	18,000	200

It should be noted in the table that the combined real estate loans of banks and insurance companies and building and loan associations increased only 28 per cent in five years, and bank loans secured by real estate increased only 16 per cent. During the same period bank loans secured by collateral other than real estate increased 30 per cent. Total loans and discounts of banks in the United States increased 54 per cent. Individual bank deposits in the United States increased 59 per cent, stocks and bonds owned by banks and insurance companies increased 68 per cent, and savings in the United States are estimated to have increased 200 per cent.

Real estate loans of banks compared with their total resources.

The fact that real estate loans of banks in the United States have not kept pace with the total resources of banks is shown clearly in Table 89.

TABLE 89.—*Real estate loans of banks compared with their total resources in 1913, 1917, and 1918.*

[In millions of dollars.]

	Total resources.	Real estate loans including mortgages owned.	Per cent real estate loans comprised of total resources.
1913	25,712	3,548	13.9
1917	37,126	4,430	11.9
1918	40,726	4,100	10.1

The foregoing statistics are from the annual reports of the Comptroller of the Currency for the years 1913, 1917, and 1918. The figures for real estate loans as given by the comptroller were modified for reasons already explained in this chapter. The figures actually given for real estate loans by banks in the comptroller's reports were $3,677,000,000 in 1917 and $3,138,000,000 in 1918.

It will be noted that Table 89 shows real estate loans by banks comprised 13.9 per cent of their total resources in 1913; 11.9 per cent in 1917, and 10.1 per cent in 1918. If the figures given in the comptroller's reports for 1917 and 1918 had been taken the percentage of those years would have been considerably lower. If the real estate loans of banks in the United States had increased from 1913 to 1918 in proportion to the total resources of the banks they would have amounted in 1918 to $5,620,000,000, or $1,520,000,000 more than in the estimate above and $2,482,000,000 more than the figure given in the Comptroller's Annual Report for 1918.

Resources of savings banks, insurance companies, and building and loan associations compared with resources of banks other than savings banks.

The total resources of mutual savings banks, insurance companies, and building and loan associations, which are the principal source of real estate loans in the United States, have increased much less rapidly than the total resources of banks other than savings banks, as shown in Table 90.

TABLE 90.—*Total resources of mutual savings banks, insurance companies, and building and loan associations compared with the total resources of banks other than mutual savings banks in the United States.*

[In millions of dollars.]

	1913	1918	Increase.
			Per cent.
Savings banks, June 30	4,105	4,819	17
Insurance companies, Jan. 1	4,409	5,941	35
Building and loan associations, Jan. 1	1,138	1,769	55
All banks, other than mutual savings banks, June 30	21,607	35,907	66

It will be noted in Table 90 that the resources of savings banks increased only 17 per cent from 1913 to 1918, whereas the resources of all other banks combined increased 66 per cent. Insurance companies did better than savings banks, but the relative increase was but little more than half as great as that of banks other than savings banks. Building and loan associations, however, increased in resources almost in proportion to the banks, but their total resources, as will be noted, are much smaller than the resources of savings banks and insurance companies.

Real estate loans of New York banking institutions.

The conclusions reached from a study of the banking statistics of the United States as a whole may be confirmed by a study of the banking statistics of the State of New York. The problem of statistics that are not comparable for different years does not arise in the study of banking statistics for this one State. New York banks, exclusive of national banks in New York, hold nearly one-sixth of all the banking resources of the country.

Tables 91, 92, and 93 are based on the New York State Bank Reports. Table 94 is from the annual reports of the Comptroller of the Currency. From these four tables relating to New York banks the following facts may be noted: In 1917 there were reported in the report of banks of deposit and discount and private banks of New York 880 financial institutions. These institutions had resources in the aggregate of $6,410,016,000. This did not include the resources of the national banks which do not report to the State banking department.

The most important classes of financial institutions in New York are State banks, savings banks, trust companies, private banks, investment companies, and savings and loan associations. These were the only groups reported in the New York banking reports in 1917, which held in the aggregate resources in excess of $10,000,000. Savings banks, trust companies, and State banks held about 97 per cent of the total resources of financial institutions reporting to the State.

From the New York banking reports, as shown in Table 93, it appears that the mortgages owned by trust companies increased 3 per cent from 1914 to 1917, and that the loans and discounts secured by real estate collateral held by trust companies increased 2 per cent from 1914 to 1917. During the same period loans and discounts secured by other collateral held by the trust companies of New York increased 55 per cent. Loans and discounts and bills purchased, not secured by collateral, increased 166 per cent. Stock and bond investments increased 88 per cent, and the total resources of the New York trust companies increased 84 per cent. It should be mentioned that the mortgages owned by trust companies in 1917 amount to $94,000,000 as against loans and discounts secured by real estate collateral amounting to $14,000,000.

In the case of State banks, mortgages owned increased from September, 1914, to September, 1917, 26 per cent, and loans and discounts secured by real estate collateral decreased 16 per cent. If the two figures are combined the increase is 4 per cent. Mortgages owned by State banks in 1917 amounted to $14,000,000 and loans and discounts secured by real estate collateral to $10,000,000. As against the increase of 4 per cent from 1914 to 1917 in the amount of mortgages owned and loans and discounts secured by real estate collateral, the loans and discounts of State banks secured by other collateral increased 21 per cent. Loans and discounts and bills purchased not secured by collateral increased 13 per cent. Public securities owned by State banks increased 282 per cent, private securities 55 per cent, and total resources 36 per cent. The conclusion to be drawn from these statistics is that real estate loans by banks and trust companies in the State of New York have not increased in recent years in proportion to other assets of these institutions.

Table 94 gives real estate loans and total loans and discounts, total investments, and total resources of State banks, mutual savings banks, private banks, and trust companies for each year from 1914 to 1917. It also shows the total increase in percentage in the various assets of the different classes of banks included, and the percentage of the total assets of the kinds included in the total held by each class of banks. It may be noted in this total that mutual savings banks in 1914 held 89.3 per cent and in 1917 89.1 per cent of all the real estate loans held by these four classes of banks. Trust companies held most of the remainder, 9 per cent in 1914 and 8.9 per cent in 1917.

From 1914 to 1917, the table shows that State banks increased their real estate loans 38 per cent, mutual savings banks 11 per cent, trust companies 12 per cent, and that the total real estate loans shown by the four classes of institutions increased 11 per cent. (It may be noted, at this point, that the increase in real estate loans shown for

the State banks is much larger than the increase shown for these banks in the table based on New York State banking statistics.)

TABLE 91.—*Number of financial institutions of different classes in New York State, 1914–1917.*

	1914	1915	1916	1917
Banks of deposit and discounts (State banks)	197	200	202	212
Savings banks	140	140	141	141
Trust companies	81	81	89	99
Private banks	.....	75	76	80
Safe-deposit companies	47	46	47	48
Investment companies	10	11	12	17
Security companies	2	2	2	2
Savings and loan associations	241	245	251	252
Building lot associations	1	1	1	1
Land Bank of New York	.....	.....	1	1
Credit unions	.....	2	14	14
Personal loan companies	19	19	19	19
Personal loan brokers	.....	1	2	2
	742	823	857	888

Source: Report on Banks of Discount and Private Bankers, New York, 1914–1917.

TABLE 92.—*Resources of different classes of financial institutions of New York State 1914–1917.*

[In thousands of dollars.]

	1914	1915	1916	1917
Banks of deposit and discount (State banks)	658,768	671,142	840,704	933,437
Savings banks	1,912,024	1,930,596	2,053,172	2,172,916
Trust companies	1,714,954	2,153,537	2,626,431	3,164,170
Private banks	.....	14,094	15,078	15,505
Safe-deposit companies	8,965	8,855	8,913	8,901
Investment companies	18,562	19,661	21,590	32,624
Security companies	2,174	2,184	2,186	2,190
Saving and loan associations	64,250	68,476	72,420	79,630
Building lot associations	27	27	27	7
Land Bank of New York	.....	.....	152	476
Credit unions	.....	6	68	212
Personal loan companies	694	675	812	993
Personal loan brokers	.....	10	12	15
	4,380,418	4,871,265	5,841,565	6,410,016

Source: Report on Banks of Discount and Private Bankers, New York, 1914–1917.

TABLE 93.—*Real estate loans and other assets of trust companies and State banks of New York State.*

[In millions of dollars.]

	1914, Sept.	1915, Sept.	1916, Sept.	1917, Sept.	Per cent increase, 1914–1917.
TRUST COMPANIES.					
Number of companies	81	81	89	99	.....
Mortgages owned	91.5	90.5	91.5	94.1	3
Loans and discounts secured by real estate collateral	13.9	14.2	15.4	14.2	2
Loans and discounts secured by other collateral	582.0	683.4	927.7	901.0	55
Loans and discounts and bills purchased not secured by collateral	191.2	216.9	324.5	509.0	166
Stock and bond investments	457.8	497.0	582.8	860.7	88
Total resources	1,715.0	2,155.5	2,626.4	3,164.1	84
STATE BANKS.					
Number of banks	197	200	202	212	.....
Mortgages owned	11.1	11.7	13.2	14.0	26
Loans and discounts secured by real estate collateral	12.0	11.3	10.7	10.1	a 16
Loans and discounts secured by other collateral	140.3	160.0	175.8	169.5	21
Loans and discounts and bills purchased not secured by collateral	222.5	203.0	220.4	250.7	13
Stock and bond investment public securities	25.7	18.9	24.2	98.2	282
Private securities	61.7	75.2	102.9	95.5	55
Total resources	685.8	671.1	840.7	952.4	36

a Decrease.

Source: Report on Banks of Discount and Private Banks, New York, 1914–1917.

TABLE 94.—*Real estate loans and other assets of banks and trust companies in New York State, 1914–1917.*

[In thousands of dollars.]

	1914	1915	1916	1917	Total increase, 1914–1917.	Per cent of total in 1914, by classes of banks.	Per cent of total in 1917, by classes of banks.
					Per cent.		
Real estate loans:							
State banks	17,751	21,022	23,790	24,456	33	1.6	2.0
Mutual savings banks	1,007,754	1,008,414	1,059,403	1,113,895	11	89.3	89.1
Private banks	1,675	1,884	1,090	.....	.....	.1	.....
Trust companies	100,700	104,534	107,707	112,264	12	9.0	8.9
Total real estate loans	1,127,880	1,135,854	1,191,990	1,250,614	11	.....	.....
Total loans and discounts:							
State banks	375,760	375,243	407,529	462,697	24	16.5	14.2
Mutual savings banks	1,010,374	1,026,902	1,059,570	1,139,518	12	44.3	35.0
Private banks	4,299	3,927	2,040	2,289	a 48	.2	60.1
Trust companies	888,706	959,919	1,374,775	1,658,155	87	39.0	50.7
Total loans and discounts	2,279,139	2,365,991	2,843,914	3,262,559	43	.....	.....
Investments:							
State banks	81,602	92,250	127,345	145,974	79	6.4	9.1
Mutual savings banks	761,105	761,993	793,517	845,722	11	59.4	52.9
Private banks	7,540	5,782	4,332	4,558	a 40	.6	.3
Trust companies	433,829	478,628	593,330	603,464	40	33.6	37.7
Total investments	1,284,076	1,338,603	1,516,524	1,599,718	25	.....	.....
Total resources:							
State banks	691,668	701,952	818,384	898,586	30	15.5	14.9
Mutual savings banks	1,933,803	1,955,962	2,053,172	2,172,918	12	43.3	36.0
Private banks	23,393	18,099	14,044	15,019	35	.5	.2
Trust companies	1,818,194	2,025,509	2,626,858	2,941,291	63	40.7	48.9
Total resources	4,467,058	4,801,522	5,512,468	6,027,812	35	.....	.....

a Decrease.

Source: Annual Reports of the Comptroller of the Currency, 1914–1917.

TABLE 95.—*Real estate loans and total assets of New York State financial institutions, 1914–1919.*

	Mortgages owned and loans on real estate collateral.	Total assets.	Per centum of total assets loaned on real estate security.
Jan. 1, 1914.			
Banks	$17,704,854	$625,806,406	3.12
Trust companies	107,475,322	1,574,656,207	6.82
Savings banks	989,790,762	1,926,334,331	51.38
Private bankers			
Safe-deposit companies	137,550	8,964,583	1.53
Investment companies	15,770,698	18,561,654	84.98
Savings and loan associations	57,002,404	64,249,990	88.71
Total	1,189,887,589	4,218,573,171	
Jan. 1, 1915.			
Banks	23,761,530	643,234,361	3.66
Trust companies	108,193,046	1,740,598,437	6.21
Savings banks	1,017,493,972	1,912,204,573	53.21
Private bankers	1,715,945	18,462,092	9.29
Safe-deposit companies	141,600	8,855,261	1.59
Investment companies	15,679,254	19,661,333	79.74
Savings and loan associations	61,119,001	68,476,499	89.24
Total	1,228,014,348	4,416,492,456	
Jan. 1, 1916.			
Banks	23,330,370	793,428,884	2.94
Trust companies	104,338,829	2,532,892,786	4.11
Savings banks	1,043,325,012	1,974,046,375	52.84
Private bankers	1,435,524	14,110,555	10.17
Safe-deposit companies	272,250	8,912,606	3.05
Investment companies	15,644,032	21,589,876	72.46
Savings and loan associations	64,440,907	72,419,658	88.98
Land bank	102,250	151,777	67.37
Total	1,252,889,174	5,417,552,517	
Jan. 1, 1917.			
Banks	23,746,556	901,845,248	2.63
Trust companies	106,648,728	2,744,317,081	3.88
Savings banks	1,091,549,464	2,139,299,037	51.02
Private bankers	1,277,677	16,070,993	7.95
Safe-deposit companies	268,625	8,900,505	3.01
Investment companies	15,365,724	32,624,312	47.09
Savings and loan associations	70,466,266	79,629,881	88.49
Land bank	379,725	475,570	79.85
Total	1,309,702,765	5,923,162,627	
Jan. 1, 1918.			
Banks	24,083,905	932,437,232	2.58
Trust companies	108,344,088	3,164,170,014	3.42
Savings banks	1,114,126,585	2,165,939,081	51.43
Private bankers	653,405	15,505,206	4.21
Safe-deposit companies	277,190	9,855,546	2.81
Investment companies	15,985,534	55,079,104	29.02
Savings and loan associations	75,580,810	86,072,829	87.81
Land bank	704,675	757,932	92.97
Total	1,339,756,192	6,429,816,944	
Jan. 1, 1919.			
Banks	22,619,969	1,020,241,730	2.21
Trust companies	105,186,948	3,221,371,809	3.26
Savings banks	1,104,068,865	2,231,461,928	49.47
Private bankers	653,796	19,670,503	3.32
Safe-deposit companies	296,035	10,406,332	2.84
Investment companies	13,887,124	95,400,400	14.55
Savings and loan associations	76,427,796	89,017,871	85.95
Land banks	631,875	667,662	94.64
Total	1,323,772,408	6,688,238,235	

NOTE.—While all the institutions subject to the supervision of the New York banking department do not report as of January 1, the reports nearest that date have been taken for purposes of tabulation.

As against an increase of 11 per cent in the real estate loans of these four classes of banks from 1914 to 1917, their total loans and discounts increased 43 per cent; their total investments, 25 per cent, and their total resources, 35 per cent.

A point of prime importance is that New York savings banks, the main source of real estate loans, increased much less rapidly in resources than trust companies and State banks. Whereas the resources of savings banks increased only 12 per cent from 1914 to 1917, the resources of State banks increased 30 per cent and trust companies 63 per cent. (An even greater increase is shown in the statistics from the State banking department, in the case of State banking companies, 36 per cent, and in the case of trust companies, 84 per cent.)

In 1914 the resources of savings banks comprised 43.3 per cent of the total resources of the State banks, trust companies, private banks and mutual savings banks, whereas the resources of trust companies comprised only 10.7 per cent, but in 1917 the percentage was 36 per cent for savings banks and 46.9 per cent for trust companies.

Table 95 shows the real estate loans of all classes of New York banking institutions as compared with their total resources from 1914 to 1919. It shows the general tendency for the percentage of total resources invested in real estate loans to diminish from year to year.

Developments during 1917 and 1918.

As has been pointed out, real estate loans of the chief lending institutions have not kept pace in the last five years with the expansion of the country in general. During 1917 and 1918 real estate loans appear not only not to have increased in proportion to the general growth of the country but to have actually decreased in amount, particularly during the latter part of this two-year period. The replies to questionnaires received from ten important savings banks in the New England States, Pennsylvania, New York, Maryland, and Minnesota show real estate loans in December, 1916, of $131,591,000; in November, 1918, $132,661,000; and in February, 1919, $131,710,000. The increases from December, 1916, to November, 1918, amounted to 0.8 per cent and from December, 1916, to February 1, 1919, to 0.09 per cent; that is to say, the decrease from November 1, 1918, to February 1, 1919, almost equaled the increase from December 31, 1916, to November 1, 1918.

Returns from the State banking departments of Ohio, Missouri, and New York for 1918 have been received. The Ohio report shows the following facts in regard to real estate loans of banks:

The total of loans and discounts (on Dec. 31, 1918) was $543,041,839, an increase of $15,003,629 since August 31, 1918, and an increase as compared with December, 1917, of $11,214,960. Loans on real estate were reported at $195,849,276, or a further decline in such loans of $3,512,782 since August 31, 1918. The percentage of loans and dis-

counts to total deposits in State banks December 31 [1918], was 63.28 as compared with 61.37 August 31 [1918], and 62.42 December 31, 1917. The proportion of loans on real estate to capital, surplus, and total deposits December 31 [1918], was 20.45 per cent as compared with 21.16 per cent on August 31 [1918], and 22.17 per cent as compared with December 31, a year ago. The decline in real estate loans during the year was approximately $11,500,000.

The 1918 report of the Bank Commissioner of Missouri shows that the real estate loans held by the bank and trust companies of Missouri amounted to $70,262,000 on November 4, 1918, as against $75,222,000 on November 20, 1917, a decrease of almost $5,000,000. During the same period the total resources of these banks increased from $667,546,000 to $761,992,000.

The reader is referred to Table 95 for a comparison of real estate loans of New York banking institutions on January 1, 1918, and January 1, 1919. A considerable decrease is shown.

FACTORS TENDING TO RESTRICT THE SUPPLY OF CAPITAL AVAILABLE FOR INVESTMENT IN BUILDING ENTERPRISES AND PERMANENT MORTGAGE LOANS.

Introduction.

It is a difficult matter to weigh accurately each of the separate causes which since 1914 have contributed to the changed conditions in the supply of real estate loans. Among the temporary causes have been the issue of Liberty bonds and the financial restrictions on nonessential construction; in fact, all the various modifications of control over manufacturing, transportation, banking and investment. The permanent causes tending to prevent expansion of outstanding mortgages include lack of standard methods of issue, lack of marketability, and changes in the banking system which have led the flow of banking resources into the channels of commerce and even of speculation and away from real estate investments. In the first instance, as the Government increased its borrowings and the banking system gained control of financial resources, investment funds were directed away from those activities which normally required an increasing amount of financial accommodation. One of the most prominent of these activities was the building industry. Then, too, contracts for war equipment compelled reallocation of labor and materials until the forces of production as well as those of banking credit, were shifted from less essential building activities to the needs of war. Some of these causes have contributed toward keeping down the volume of loans offered while others have operated toward reducing the demand for loans by making construction impossible.

War restrictions.

It may be of interest to enumerate some of the restrictions that were imposed to limit activities in nonessential lines.

The War Industries Board published regulations withdrawing priority assistance from projects not contributing to the processes of war. The Railroad Administration established priority shipment orders carrying preference in supply and movement to many commodities and specifically excepted many other commodities, including that portion of building materials destined for nonessential construction. There was a 50 per cent to 75 per cent reduction in numbers of styles and sizes and in quantity of production in many lines of manufactured commodities. These no longer were available for building. The War Industries Board published a classified preference list of industries and plants to be considered as war essentials and thereby specifically restricted normal activities in the building industry. The Capital Issues Committee of the Federal Reserve Board curtailed nonessential credits, thus discriminating against the activity of the title guaranty and mortgage sellers of real estate debentures and real estate collateral trust bonds, while on the other hand it became the duty of the War Finance Corporation to provide credit facilities for the support of war activities not otherwise provided for.

Lack of standardized methods.

In discussing the causes which may further restrict an increase in the amount of capital available for investment in building loans and mortgages, it is important to note that real estate lending is a process of investment not subject to standardized conditions except those which obtain to a limited extent within the markets reached by the title guaranty and trust companies. This lack of standard conditions in the issue of most mortgage loans deprives the security of a very desirable quality, known as marketability.

The person who invests in a real estate loan is subject to the inconvenience and expense of making directly or indirectly a special and often costly investigation of the security offered, and although the investment may be the most excellent security he has no open general market on which to sell and is likely to have to wait for the loan to mature before he can recover his capital. This is a disadvantage which may tend to deflect the current of available funds for investment away from real estate loans into other channels. For example, in the State of New York stock and bond investments of banks increased 25 per cent from 1914 to 1917, while real estate loans of these banks increased only 11¾ per cent.

State laws not to blame.

In this connection it is frequently asked, Are State laws to blame for reduced investment in mortgage loans? In reply to this question,

we refer to Mr. Coulter's remarks before the Rural Credits subcommittee, wherein he stated:

> It is a fact that practically every State bank in the United States now could legally lend on real estate security. I have got the banking laws of every State and have studied them to see to what extent the State banks and private banks could lend with real estate as security, and there is almost no limitation. But at the same time the State banks and private banks do not lend to a very large extent on mortgages, because they are in the same system with the national banking associations and have to do the same sort of business in order to keep in the same class and get their paper discounted. They imitate the national bank because the national bank is the standard; that is the style; that is the method of doing business. They have constant intercourse with and follow the lead of the national banks.

Mr. Coulter at that time was evidently convinced by a study of the digests of State banking laws that State banks were allowed to loan money on real estate practically without limitation.

In addition the State laws provide adequate security for mortgage loans in the event of default. In this connection we quote an excerpt from the Second Annual Report of the Federal Farm Loan Board:

> An examination of the laws of the several States, provided for in the thirtieth section of the act, to determine whether these laws were such as to assure the holder of a mortgage adequate safeguards against loss in the event of default revealed great differences, but with one exception (Texas) failed to disclose any State law which denied adequate security to a mortgage.

Real estate loans suffer from discrimination in rediscounting.

Having treated of the changed conditions in the supply of real estate capital, and having attributed these changes mainly to causes connected with the war, which have now ceased to operate, we naturally turn to those other causes which lie within the banking system itself. Here we find a process of rearrangement that promises eventually to bring about a marked change in the activities of the banks. This opinion is based on the fact that nonmember banks are becoming more and more united in their efforts to gain membership in the Federal Reserve system. Two lines of activity are being applied to bring this about. One is the educational campaign being carried on by the American Bankers Association to secure State legislation enabling State institutions to join the Federal Reserve system, without first having to become national banks. The other line of activity is the educational campaign being conducted by the United States Council of State Banking Associations to interest both State and National legislatures and the constituent members of the association in proposed amendments pertaining to the operation of the Federal Reserve act, all of which amendments are drawn with a view toward creating greater banking uniformity. For the reason that national banks will be allowed to compete with State banks, it will be to the interest of State banks that State laws also shall allow their local institutions a similar latitude. The net result will

be that each separate institution eventually will be able to offer to its customers all the banking services that any other banking institution conducts. We may look forward to the time when each bank gradually will approach a new standard by developing a complete combination of all banking services until all banking services will be offered by all banks and each bank will be like every other bank.

To show to what additional length it is planned to carry this reconstruction process, we quote, from the Fifth Annual Report of the Federal Reserve Board, a proposal to amend section 25 of the act:

> The board has, on previous occasions, recommended to Congress that the Federal Reserve act be amended so as to permit national banks under certain conditions to establish branches not to exceed ten in number within the corporate limits of the city or town in which it is located, provided the State laws extend a similar privilege to competing State corporations. As the law now stands national banks are at a serious disadvantage in meeting the competition of State banks with branches. In the opinion of the board the proper development of the Federal Reserve system makes it necessary to *coordinate as far as possible the powers of all member banks*. Under the existing laws State banks and trust companies in many cases are permitted to operate branches even after conversion into national banks with the result that some member banks have advantages which others do not enjoy. The board therefore renews its recommendation that this amendment be adopted, being confident that it will prove beneficial to the Federal Reserve system, as well as to the communities concerned.

Now it is argued that these proposed changes have not affected and will not affect the amount of financial capital ordinarily available for investment in real estate mortgages because eligible State banks will join the system only when their business of deposit and discount is of such a nature and volume as to benefit by the new facilities. Logically, therefore, to other types of banks, devoting their attention to real estate loans, membership would be of slight advantage. These will not join. Therefore the increase in number of member State banks, even if occuring at a time of reduced investment in real estate mortgages, would not necessarily be the cause of this reduction. This view is held for example by C. S. McCain, vice president of the Bankers Trust Co., Little Rock, Ark., who writes as follows:

> There is no question that the rediscount privilege will have a tendency to increase our loans that are available for rediscount. In this State the business of the trust companies is not segregated to the extent it is in the eastern or even the middle western States, so that we have very broad powers under our trust company charters and do a commercial as well as a trust company business. I think, therefore, that the tendency will be, rather than restricting the real estate loans, to tighten up on our commercial loans and see that these are of such character that they are available for rediscount and in this way avail ourselves of the rediscount privilege without disposing of the privilege of real estate mortgage loans business which we now enjoy.

However, in spite of all arguments in support of the popularity of mortgage loan investments there is much official testimony of a contradictory nature. Our own statistics show that financial capital

has become relatively less available for investment in temporary building loans and mortgage loans. Mr. Walter Stabler, comptroller of the Metropolitan Life, has warned the public that large lenders were temporarily out of the market and borrowers would have to seek accommodation elsewhere. In 1914 Mr. J. Lee Coulter, testifying before the Rural Credits Subcommittee, said:

> As an illustration, you will find by a study of State laws that State banks are allowed to loan money on real estate and yet in all States the practice is that they have imitated the precedent of the national banks. Even if you authorize them by law to do a certain thing, they know in practice they must follow the general system of national banks, because they must deal through national banks and have finally to turn to them; they know that their paper on land is not good; they are modeled after the national banks in their business forms and business methods and you can not get away from that.

As excellent an authority as the Federal Reserve Annual Report of 1919 in reviewing the efforts of nonmember banks to join the system, states:

> That the entrance of mutual savings associations and stock savings banks into the Federal Reserve system will give an added impetus to the movement for State legislation authorizing such associations and banks to invest a larger proportion of their assets in liquid securities.

This same report continues:

> If these associations and banks are admitted to membership, they will be able to transfer to the Federal Reserve banks a fair proportion of their cash resources and of balances carried with other banks and will to that extent supplement the resources of the Federal Reserve banks. The banking power of the Federal Reserve system will be still further increased when such associations and banks are authorized by State law to invest a large proportion of their assets in bills, notes, drafts, and acceptances eligible for rediscount or purchase by Federal Reserve banks.

From the foregoing it may be inferred that if savings banks enter the Federal Reserve system, they will within a few years have a much smaller proportion of their assets invested in real estate loans than they have at present.

An attempt to analyze the trend of developments that inevitably must accompany and follow the internal reconstruction of the banking system, gives rise to the belief that funds destined for investment in real estate mortgages no longer will follow old channels in their customary volume. In fact the old channels and arteries of the new member banks are becoming adapted so rapidly to the elements of commercial circulation that many investment institutions already strongly advocate the application of amortization principles to their mortgage business. This is an important step toward standardized methods for handling mortgage securities and should afford a sound basis upon which a Federal mortgage bank can safely issue on broad lines under Government supervision real estate debentures and collateral trust bonds.

In discussing the mortgage loans of institutional investors, Mr. Harding, of the Federal Reserve Board, as early as 1914, said:

> The Federal Reserve banks can not with safety invest deposits on demand in non-liquid loans extending over several years. This is the function of *mortgage banks* which by means of their bonded obligations may secure for a longer period of years the funds which they propose to loan on long time mortgages.

This same trend of thought is to be observed in a letter received from the Baltimore Trust Co., from which is quoted in part:

> Obviously mortgages should have no place in the assets of Federal Reserve banks by reason of the relation of such banks to their member institutions; such members should also refrain from accepting such collateral in any large way. The Federal land banks limit their activities to country property, with the result ultimately that a great number of the interior banks of the country should be relieved of congestion ever present with them by reason of the fact that they are carrying so many mortgages. Owing to war conditions the farm banks have not had a fair chance to fulfill their purpose, but this will come. I do not know of any economic or practical reason why land banks under an amended law should not be permitted to care for city mortgages, which if half well selected are surely as sound as is the average farm mortgage and especially so should cotton ever get down again to 8 cents a pound with wheat at $1 a bushel.

The need for improved facilities.

In conclusion, it seems advisable that serious consideration be given toward devising some improved machinery for making and marketing real estate loans. This would involve: first, a standardized and simplified method of examination of the security offered on real estate loans; and, second, a system of real estate mortgage banks which would rediscount real estate mortgage loans and issue thereon real estate mortgage bonds. It is believed that such a system would decrease the cost of loans to the borrower and by facilitating loans would increase the volume of building operations. Thus there would be a permanent addition to the wealth of the country, and the small investor would gain another opportunity for safely investing his savings at a fair rate of interest.

One of the palliative measures that has been suggested seems to be worthy of consideration. Congress has been urged to exempt mortgages to the extent of $40,000 in any one person's hands from the Federal income tax so as to assure the average mortgage investor a net return commensurate with that from municipal bonds, Government bonds, farm loan bonds, and other similar investments not subject to the Federal income tax. Any such measure that would divert the flow of investors' money back into the channel of mortgage loans would encourage building, which adds to the income producing wealth of the Nation, so that, in the long run, the Government would probably recoup the loss suffered through the tax exemptions.

Conclusions.

The following conclusions may be drawn from the foregoing study:

1. The methods of making real estate loans are not sufficiently standardized, and hence are more expensive than need be. Borrower and lender are not thrown together in the present system. The channels through which the funds from the lender to the borrower should flow freely are obstructed.

2. The main sources of real estate loans are savings banks, title guarantee and trust companies, insurance companies, building and loan associations, and individual lenders.

3. Real estate loans by lending institutions did not increase in proportion to the growth of the country from 1913 to 1918.

4. Real estate loans of banks did not grow so rapidly as bank resources in the United States from 1913 to 1918.

5. Savings banks, insurance companies, and building and loan associations did not grow so rapidly in resources as banks other than savings banks in the United States.

6. Savings banks in New York State did not grow so rapidly as other classes of banks in New York from 1914 to 1917.

7. Real estate loans of banks in New York State did not grow so rapidly as the total resources of New York banks from 1914 to 1918.

8. Statistics indicate that during 1917 and 1918 there has been an absolute decrease in real estate loans held by financial institutions.

9. The main causes of the failure of real estate loans to increase in proportion to the general growth of the country during the last five years have been the lack of marketability of real estate loans, lack of standardization in making loans, changes in the banking system, Government restrictions during the war, and the issue of Liberty bonds.

10. A general amortization system for real estate loans would be beneficial.

11. Improved machinery is needed for making and marketing real estate loans. This would involve first a standardized and simplified method of examination of the security offered on real estate loans, and second a system of real estate mortgage banks with the rediscount privilege.

VI. RENTS AND LAND VALUES.

RENTS OF HOUSES AND APARTMENTS.

As a basis for a tentative estimate of the advance in rents of workingmen's houses during the war, there are available two studies made by the National Industrial Conference Board, of Boston, Mass., besides the statistics on rents published by the Bureau of Labor Statistics of the Department of Labor and the results of a questionnaire sent to real estate boards of 91 cities of the United States by the Division of Public Works and Construction Development of the Department of Labor. From its first study, covering the period from July, 1914, to June, 1918, the National Industrial Conference Board concluded that rents had not advanced more than 15 per cent in a very large proportion of industrial communities. However, the increase varied greatly not only from city to city, but in different parts of the same city.

In general, rents did not increase or increased very little in cities or parts of cities in which no increased demand for accommodations occurred because of war work; for example, in Fall River, Rochester, St. Louis, and the west end of Boston.

On the other hand, in certain cities where an exceptional demand for housing developed in consequence of war activities, a great advance in rents occurred; for example, in Bridgeport, Waterbury, Cleveland, Detroit, and the east end of Boston. In some cities no war work was carried on, and workers were attracted to other cities, leaving many vacant houses. In such cities rents dropped; for example, in East St. Louis and El Paso.

From its later study, the National Industrial Conference Board concluded that the average advance in rents from July, 1914, to November, 1918, was 20 per cent, but as in the earlier study great variations were pointed out in different cities. For example, the increase in rents paid by wage earners was over 40 per cent in Portland (Oreg.), Seattle, and Flint, and over 20 per cent in Detroit, Rockford, and Madison, but the increase was 10 per cent or less in Columbus, Providence, and Los Angeles.

The replies to a questionnaire received by the Division of Public Works and Construction Development of the Department of Labor from 91 cities served to confirm the general results of the studies of

the National Industrial Conference Board. Some of the results obtained from the questionnaire are shown in the table below:

Advance in rents of low-price apartments and houses, from January, 1916, to January, 1919.

	Cities showing no increase.	Increase 10 to 20 per cent.	Increase more than 20 per cent.
Low-price city apartments	18	35	12
Low-price houses in thickly settled portions of cities	23	30	17
Low-price houses in suburbs	31	34	6

It will be observed from these statistics that the number of cities reporting no increase was larger than the number reporting an increase of more than 20 per cent, but was less than the number reporting an increase of from 10 to 20 per cent.

It should be noted that this table shows the increase from January, 1916, to January, 1919, whereas the advances shown by the statistics of the National Industrial Conference Board represent the periods from November, 1914, to June and November, 1918, respectively.

The following table, compiled from statistics gathered by the Bureau of Labor Statistics of the Department of Labor, shows for 18 shipbuilding centers the advance in rents at the end of both 1917 and 1918 over the end of 1914:

Per cent of increase in rents above December, 1914.

	December, 1917.	December, 1918.		December, 1917.	December, 1918.
Portland, Me	2.38	2.48	Los Angeles, Calif.	a 0.64	4.43
Boston, Mass	a .06	2.76	San Francisco and Oakland, Calif.	a 4.02	a 3.93
New York, N. Y	2.63	6.47	Portland, Oreg	a 22.16	12.28
Philadelphia, Pa	2.60	8.00	Seattle, Wash	a .55	44.31
Baltimore, Md	2.96	13.78	Chicago, Ill	1.36	2.55
Norfolk, Va	a 1.72	38.96	Detroit, Mich	32.64	39.03
Savannah, Ga	a 4.32	5.90	Cleveland, Ohio	11.29	16.49
Jacksonville, Fla	a 18.65	5.89	Buffalo, N. Y	9.35	20.72
Mobile, Ala	a 3.60	11.16			
Houston, Tex	a 7.72	a 1.68			

a Decrease.

On the whole, these increases are somewhat less than the 20 per cent average advance arrived at by the National Industrial Conference Board. The statistics and conclusions brought out in foregoing paragraphs apply exclusively to workmen's housing—low-price apartments and dwellings. For information concerning the better grades of housing, only the replies received from the questionnaire of this division are available. These indicate that the advance in rents of the better grades of city apartments and houses

has been somewhat more general than in the low-price grades, but the increases over 20 per cent are fewer.

Although the increases up to January 1, 1919, were no greater than indicated in the preceding paragraph, rents increased appreciably in numerous localities after that date. The upward trend was a distinct indication of their tendency to advance by amounts bearing some relation to advances in price and wage levels.

BUSINESS RENTS.

The replies to the questionnaire sent out from this division showed that business rents had increased even less than residence rents.

Advance in rents of stores and offices from January, 1916, to January, 1919.

	Cities showing no increase.	Increase 10 to 20 per cent.	Increase more than 20 per cent.
Stores	43	14	9
Offices	42	16	8

LAND VALUES.

One of the questions asked in the questionnaire of this division read as follows: "What changes, if any since 1916 has taken place in the prices of land suitable for (1) office buildings, (2) stores, (3) houses and apartments in residential districts?" Approximately two-thirds of the answers stated that no change had occurred in the value of land suitable for any of those three classes of buildings.

A few replies stated that the value of land had decreased. Less than one-third of the replies stated that land values had increased, and in most cases where an increase was indicated it was less than 25 per cent.

The conclusion that there was no general advance in city land values during the war is confirmed by statistics of tax assessment valuations. Although assessed valuations of real estate do not always accurately reflect the market values of the property, nevertheless there has been a tendency in recent years for assessed values to approach more closely to market values, instead of remaining far below as was formerly the case. Consequently, if there had been any increase in the value of real property in recent years, it should be shown by at least as great an increase in assessed valuations. The figures indicate, however, that assessed valuations of real estate in cities of 30,000 or over increased from 1913 to 1915 (two years) by 7.09 per cent, on the average; from 1915 to 1916 by an average of 6.73 per cent; from 1916 to 1917 by an average of 4.14 per cent; and from 1917 to 1918 by an average of not over 4 per cent. (The figures

for 1918 are not yet published, but were kindly provided for the purpose of this inquiry by the Census Bureau.) In deriving these figures allowance has been made for the increase in the number of cities reported, but no allowance has been possible for increases in the areas of individual cities.

If the value of real estate had increased since 1913 at the same rate as the prices of commodities, and assessed valuations had risen just enough to correspond, the assessed valuation of real estate in all cities of the United States of 30,000 or over would have been at least $46,000,000,000 in the fiscal year ended June 30, 1918, instead of its actual amount, less than $31,000,000,000.

REAL ESTATE BOOKKEEPING.

The value of land is fundamentally determined by the demand for it. In cities this means the demand for buildings of all sorts, and this in turn results from the conditions or prospects of business and the growth of population (which to some extent continues irrespective of fluctuations in prosperity).

Besides the demand for buildings, the cost of erecting and maintaining them comes into the determination of land values. This includes costs of material and of labor, the rate of interest, and taxes, including assessments for city improvements. Any attempt to foresee the future course of land values must consist in an analysis of each of the above-mentioned factors. However, it was found that recent statistics bearing on a number of these factors were not available. It was determined therefore to draw up a questionnaire that would reveal not only the tendency of net rents in the last four years, but also the tendency as regards the several items affecting net rents from the point of view of sound real estate bookkeeping.

The questionnaire is mainly the work of Irving Macomber, vice president of the United States Housing Corporation, in consultation with Mr. Ingersoll, secretary of the National Association of Real Estate Boards. It was sent to 150 real estate boards by Mr. Ingersoll, with the request that each board appoint a committee to procure the desired information. Although the replies were received too late for tabulation, a portion of the questionnaire is reprinted here as an example of the classification of revenues and expenses which sound real estate bookkeeping demands:

CLASSIFICATION OF REVENUE AND EXPENSE ITEMS.

SHOWING DISTRIBUTION DESIRED ON FORM A.

REVENUES:

RENT EARNED—

Accruals on occupancy, whether collected or uncollected.

OTHER REVENUES—

All profits on telephone service, electricity, water, supplies, waste paper, janitor service, etc.

OPERATIVE EXPENSES:

MAINTENANCE—

Upkeep of grounds: Walks, drives, fences and walls, lawn and garden, planting, general, etc.

Upkeep of building: Roofs and downspouts, porches and areas, halls and stairways, rooms and closets, laundries and lockers, general, etc.

Upkeep of equipment: Screens and awnings, stoves and gas logs, furnishings, safety appliances, telephone and signals, lighting, tanks and cisterns, other plumbing, pumps and heaters, other heating, chutes and incinerators, machinery and tools, sprinkler system, elevators, engines, generators, general, etc.

SERVICE—

Electricity, water, supplies, coal, gas, steam, wages of all employees, disposal of ashes, of rubbish, of garbage, inspection, telephone, etc.

INSURANCE—

Fire protection on building, on furnishings, on rents, etc.; liability protection on employees, on general public, on boilers, on elevators, etc.; plate-glass protection on windows, etc.

SALARIES—

Building superintendent and his office employees.

TAXES—

Levied on land, building, and equipment.

ASSESSMENTS—

Levied with taxes for street lighting, street cleaning, street maintenance, street improvements, etc.

OPERATIVE EXPENSES—Continued.

DEPRECIATION—RESERVE—

Arbitrary amount, or predetermined per cent of building cost and equipment cost, written off for physical deterioration and obsolescence.

ADMINISTRATIVE EXPENSES:

OFFICE OVERHEAD—

Cost of office equipment and appliances, rent for space occupied, janitor service, telephone and telegraph service, magazines and papers, reports and directories, supplies, postage, electricity, water, steam, gas; fire insurance on equipment and records, liability insurance on office employees, indemnity insurance on general public; legal services, legal counsel, and other legal items, advertising, general taxes on personal property, on moneys, on credits, etc.; depreciation of equipment, etc.; commissions paid, salaries of building manager and employees, or equivalent in owner's time and attention, etc.

RENT CONCEDED—

Accruals on occupancy given to tenants as an inducement or bonus and for which they are not charged and do not pay.

DOUBTFUL ACCOUNTS—RESERVE—

Actual amount or predetermined per cent of outstanding accounts receivable written off as uncollectible and lost.

INTEREST—

Accruals, commissions, and expenses in effecting and renewing loans, etc.

NOTE.—PER CENT OCCUPANCY.

Number of months of actual use or occupancy divided by the number of months of possible occupancy.

Or number of square feet of actual occupancy (averaged) divided by number of square feet of possible occupancy.

FORM A.—COMPARATIVE YEARLY FINANCIAL STATEMENT.

Class of building..... *City and State*.....

Property designation.	Prewar period.			War period.		Increase, 1918 over 1916.		Decrease, 1918 over 1916.	
Code number.	1914	1915	1916	1917	1918	Amount.	Per cent.	Amount.	Per cent.
Revenues:									
Rent earned									
Other revenues									
Total revenues									
Expenses:									
Maintenance									
Service									
Insurance									
Salaries									
Taxes									
Assessments									
Depreciation—reserve									
Total operative									
Office overhead									
Rent conceded									
Doubtful accounts—reserve									
Total administrative									
Total expenses									
Revenues less expenses									
Interest (deduct)									
Net earnings—amount									
Per cent occupancy									
Net earnings, per cent of equity									
Capital investment:									
Loan									
Equity									
Total investment									
Tax value of property:									
Land									
Building									
Total tax value									
Tax rate per 1,000									
Population (best local estimate)									

EXPLANATORY NOTES.

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VII. DEFERRED CONSTRUCTION.

The Division of Public Works and Construction Development of the Information and Education Service of the Department of Labor sent out in January about 15,000 questionnaires, mainly to architects, engineers, and State, county, and city officials throughout the United States.

The questionnaired were asked to report on projects which had been planned but not constructed at the time of the armistice, to give the estimated cost of these projects, and to state why contracts for them had not been let since the armistice.

Projects to the number of 6,472 were reported on, with a total valuation of $1,711,802,000. Some of the projects had been deferred for two years because of war restrictions and war conditions. The results of this questionnaire have been tabulated and are shown in Tables 96 to 104, inclusive.

As reasons for postponing building operations, 1,781 questionnaires, 29 per cent, reported materials too high; 1,320, 20.5 per cent, reported wages too high; 401, 6 per cent, reported difficulty in obtaining loans; 4 per cent reported shortage of materials; a comparatively small number reported inefficiency of labor.

Conclusion: It is apparent that high costs of material and labor were the compelling reasons for the hesitancy in building after the armistice. Shortage of materials and shortage of labor were local phenomena and not widespread. Difficulty of obtaining loans was in part a result of the high cost of building. The main task that confronted the building industry of the country was, therefore, either the removal of these high costs or some readjustment to them.

TABLE 96.—*Deferred construction projects.*

[Tabulated from replies to a questionnaire of the Division of Public Works and Construction Development.]

States.	Number of projects.	Valuations.	States.	Number of projects.	Valuations.
Alabama	54	$67,110,000	Nevada	3	$1,860,000
Alaska	4	1,100,000	New Hampshire	20	2,165,000
Arizona	34	9,580,000	New Jersey	328	62,995,000
Arkansas	78	12,225,000	New Mexico	26	4,000,000
California	144	110,000,000	New York	673	164,465,000
Colorado	69	23,415,000	North Carolina	31	4,160,000
Connecticut	110	23,390,000	North Dakota	38	3,040,000
Delaware	14	6,365,000	Ohio	805	171,335,000
District of Columbia	22	6,470,000	Oklahoma	77	9,275,000
Florida	14	1,140,000	Oregon	34	6,875,000
Georgia	24	10,675,000	Pennsylvania	662	127,345,000
Idaho	39	8,645,000	Rhode Island	22	14,830,000
Illinois	365	175,045,000	South Carolina	46	28,250,000
Indiana	179	21,300,000	South Dakota	65	5,225,000
Iowa	218	26,390,000	Tennessee	52	6,720,000
Kansas	139	34,295,000	Texas	89	23,290,000
Kentucky	92	13,155,000	Utah	78	19,275,000
Louisiana	100	38,030,000	Vermont	15	1,350,000
Maine	49	4,775,000	Virginia	97	34,530,000
Maryland	58	14,615,000	Washington	105	46,615,000
Massachusetts	227	44,390,000	West Virginia	92	16,355,000
Michigan	230	131,285,000	Wisconsin	224	32,090,000
Minnesota	150	36,710,000	Wyoming	17	3,355,000
Mississippi	39	11,500,000	Miscellaneous	35	5,445,000
Missouri	231	126,185,000	Total	6,472	1,711,802,000
Montana	63	5,830,000			
Nebraska	85	16,710,000			

PRIVATE.

Classes.	Number of projects.	Valuations.	Classes.	Number of projects.	Valuations.
Apartments	185	$21,485,000	Manufacturing	388	$79,740,000
Amusements	57	8,850,000	Religious	318	17,655,000
Business	766	100,787,000	Social	117	15,345,000
Dwellings	729	34,675,000	Miscellaneous	197	52,345,000
Educational	95	10,120,000	Total	3,378	481,062,000
Hospitals and homes	85	14,190,000			
Hotels	78	33,940,000			

PUBLIC.

Classes.	Number of projects.	Valuations.	Classes.	Number of projects.	Valuations.
Bridges	178	$49,090,000	Sewers	294	381,755,000
Canals, levees, and water fronts	93	88,870,000	Street improvements and road work	1,396	448,155,000
City halls	59	10,755,000	Water works	348	204,350,000
Fire and police stations	25	4,200,000	Railroad work	23	93,690,000
Hospitals, institutions, and homes	203	63,870,000	Miscellaneous	289	164,068,000
Lighting plants	30	14,660,000	Total	3,094	1,230,740,000
Schools	508	113,260,000			

TABLE 97.—*Deferred projects—public buildings and public utilities.*

BRIDGES, CANALS, LEVEES, AND WATER FRONTS.

[Tabulated from replies to a questionnaire of the Division of Public Works and Construction Development.]

States.	Bridges.		Canals, levees, and waterfronts.	
	Number of projects.	Value in thousands of dollars.	Number of projects.	Value in thousands of dollars.
Alabama			3	1,000
Arkansas	1	500	1	150
California	3	115	5	865
Colorado	2	65	1	100
Connecticut	3	520	2	600
Idaho	4	350	1	10
Illinois	12	10,550	5	1,260
Indiana	4	80	8	800
Iowa	17	1,240	5	2,690
Kansas	13	900	1	100
Kentucky	1	2,500	1	100
Louisiana			1	20,000
Maine	1	250	1	10
Maryland	1	30		
Massachusetts	6	870	1	15
Michigan	5	1,220	3	265
Minnesota	2	35	1	300
Mississippi	1	830	3	3,950
Missouri	7	1,350	3	12,000
Montana	1	200		
Nebraska	3	90		
New Jersey	1	2,500	4	145
New Mexico	1	10		
New York	5	2,100	10	13,700
North Dakota	3	250		
Ohio	12	8,890	6	5,100
Oklahoma	4	450	1	30
Oregon	1	900	2	1,400
Pennsylvania	25	4,615	4	6,120
Rhode Island			2	1,210
South Carolina	1	1,000	1	5,000
South Dakota	3	150		
Tennessee	1	250	1	1,800
Texas			2	300
Utah	3	60	1	10
Virginia	4	185	2	70
Washington	7	3,500	6	4,660
West Virginia	3	860	3	1,900
Wisconsin	14	1,515	2	210
Wyoming	1	100		
Miscellaneous	2	60	1	3,000
Total	178	49,090	93	88,870

TABLE 98.—*Deferred projects—public buildings and public utilities.*

CITY HALLS, FIRE AND POLICE STATIONS.

[Tabulated from replies to a questionnaire of the Division of Public Works and Construction Development.]

States.	City halls.		Fire and police stations.	
	Number of projects.	Value in thousands of dollars.	Number of projects.	Value in thousands of dollars.
Alabama	1	150		
Arkansas	1	10		
California	3	650		
Colorado	1	100	1	50
Georgia	2	200		
Indiana	3	775		
Iowa			1	100
Kansas	1	15		
Kentucky	3	550		
Maine	1	25		
Massachusetts	1	400	1	40
Michigan	1	10	5	2,350
Minnesota	3	70	2	70
Mississippi	1	100	1	10
Missouri	2	1,100	1	200
Montana	2	150		
Nebraska	2	230		
New Mexico	1	50		
New York			6	560
Ohio	7	735	3	740
Oklahoma	2	50		
Pennsylvania	6	4,270	1	40
South Dakota	1	20	1	15
Texas	2	60		
Utah	2	650		
Virginia	1	10		
Washington	1	15		
West Virginia	3	230	2	25
Wisconsin	4	100		
Wyoming	1	30		
Total	89	10,755	25	4,200

TABLE 99.—*Deferred projects—public buildings and public utilities.*

HOSPITALS, INSTITUTIONS, AND HOMES.

[Tabulated from replies to a questionnaire of the Division of Public Works and Construction Development.]

States.	Number of projects.	Value in thousands of dollars.	States.	Number of projects.	Value in thousands of dollars.
Alabama	1	10	Nebraska	4	1,200
California	4	1,750	New Jersey	6	595
Colorado	2	1,400	New Mexico	1	40
Connecticut	1	25	New York	49	20,485
District of Columbia	3	2,100	North Carolina	1	250
Idaho	2	40	Ohio	19	10,310
Illinois	12	3,020	Oklahoma	2	550
Indiana	9	735	Oregon	2	210
Iowa	7	1,035	Pennsylvania	15	6,180
Kansas	4	275	Rhode Island	2	900
Kentucky	2	80	Tennessee	4	1,350
Louisiana	2	100	Texas	2	100
Maine	2	150	Utah	3	700
Massachusetts	14	3,720	Washington	5	950
Michigan	8	4,300	West Virginia	1	50
Minnesota	4	550	Wisconsin	6	595
Missouri	3	100			
Montana	1	15	Total	203	63,870

TABLE 100.—*Deferred projects—public buildings and public utilities.*

LIGHTING PLANTS.

[Tabulated from replies to a questionnaire of the Division of Public Works and Construction Development.]

States.	Number of projects.	Value in thousands of dollars.	States.	Number of projects.	Value in thousands of dollars.
California	2	80	Ohio	2	5,250
Colorado	1	50	Oklahoma	1	10
Illinois	3	920	South Carolina	1	300
Indiana	2	25	South Dakota	2	140
Kansas	1	20	Utah	1	500
Maine	1	40	Washington	1	5,000
Michigan	5	1,050	Wisconsin	3	335
Minnesota	1	350			
Missouri	1	500	Total	30	14,660
New Mexico	2	90			

TABLE 101.—*Deferred projects—public buildings and public utilities.*

SCHOOLS.

[Tabulated from replies to a questionnaire of the Division of Public Works and Construction Development.]

States.	Number of projects.	Value in thousands of dollars.	States.	Number of projects.	Value in thousands of dollars.
Alabama	5	2,575	Nebraska	11	465
Arizona	3	290	New Hampshire	3	260
Arkansas	3	85	New Jersey	33	195
California	11	2,255	New Mexico	2	75
Colorado	8	8,335	New York	67	25,895
Connecticut	10	3,230	North Carolina	4	300
Delaware	1	500	North Dakota	8	910
Georgia	2	75	Ohio	61	10,490
Idaho	5	340	Oklahoma	4	1,350
Illinois	22	9,455	Oregon	2	80
Indiana	13	1,430	Pennsylvania	44	9,165
Iowa	14	1,495	South Carolina	1	100
Kansas	9	820	South Dakota	9	530
Kentucky	9	445	Tennessee	3	635
Louisiana	3	800	Texas	10	900
Maine	12	480	Utah	8	1,090
Maryland	6	115	Vermont	1	20
Massachusetts	19	3,660	Virginia	8	285
Michigan	13	12,400	Washington	5	890
Minnesota	18	6,820	West Virginia	5	265
Mississippi	2	80	Wisconsin	19	2,585
Missouri	8	850			
Montana	4	240	Total	508	113,260

TABLE 102.—*Deferred projects—public buildings and public utilities.*

SEWERS, STREET IMPROVEMENTS, AND WATERWORKS.

[Tabulated from replies to a questionnaire of the Division of Public Works and Construction Development.]

States.	Sewers.		Street improvements.		Waterworks.	
	Number of projects.	Value in thousands of dollars.	Number of projects.	Value in thousands of dollars.	Number of projects	Value in thousands of dollars.
Alabama	2	120	18	1,570	1	250
Alaska			2	500		
Arizona	3	600	13	4,880	2	1,000
Arkansas	7	1,580	36	8,300	7	465
California	6	1,275	34	20,865	11	59,330
Colorado	1	10	16	6,830	7	1,670
Connecticut	6	1,020	17	5,735	7	2,080
Delaware			8	5,355	1	100
Florida			4	220	1	30
Georgia			5	435	3	700
Idaho	1	40	19	7,525	6	860
Illinois	20	10,235	106	38,830	31	9,790
Indiana	8	1,070	57	6,815	6	535
Iowa	10	1,220	60	11,125	7	330
Kansas	5	630	48	23,815	12	650
Kentucky	3	35	29	2,560	2	800
Louisiana	2	130	19	4,800	2	325
Maine	1	10	6	1,300		
Maryland	1	1,000	8	6,150	3	240
Massachusetts	15	3,480	35	11,450	13	965
Michigan	15	4,495	60	21,065	20	27,455
Minnesota	10	1,595	29	16,395	11	1,130
Mississippi	9	1,970	15	5,130	1	10
Missouri	14	15,265	50	22,480	11	11,370
Montana			19	3,140	3	750
Nebraska	5	370	17	5,155	3	35
Nevada			3	1,860		
New Hampshire			6	1,025		
New Jersey	7	415	41	9,160	5	2,975
New Mexico			14	3,175	3	210
New York	18	5,965	58	10,295	23	33,325
North Carolina			13	1,765	1	350
North Dakota			13	1,100	1	10
Ohio	46	12,460	172	64,595	40	9,840
Oklahoma	4	280	17	1,160	19	2,310
Oregon			2	1,840	3	1,110
Pennsylvania	25	6,455	52	27,440	13	9,515
Rhode Island			2	270	4	11,010
South Carolina	2	160	12	25,700		
South Dakota	7	760	15	745	7	440
Tennessee	4	420	10	1,400	5	235
Texas	7	2,485	37	6,735	8	2,490
Utah	4	1,175	19	7,855	13	1,310
Vermont			3	1,020		
Virginia	3	140	20	3,045	4	250
Washington	5	3,325	32	17,590	6	4,910
West Virginia	1	50	31	4,300	5	1,875
Wisconsin	16	1,505	79	10,835	16	1,115
Wyoming			6	1,700	1	200
Miscellaneous	1	10	9	1,120		
Total	294	81,755	1,396	448,155	348	204,350

TABLE 103.—*Deferred projects—public buildings and public utilities.*

RAILROADS, TRACKS, AND STATIONS.

[Tabulated from replies to a questionnaire of the Division of Public Works and Construction Development.]

States.	Number of projects.	Value in thousands of dollars.	States.	Number of projects.	Value in thousands of dollars.
California	1	1,000	Ohio	2	50
Illinois	2	60,300	Oklahoma	1	800
Iowa	1	1,688	Pennsylvania	2	110
Kansas	2	1,320	South Dakota	1	1,800
Louisiana	1	250	Utah	1	1,100
Michigan	5	20,497	Wyoming	2	2,710
Minnesota	1	2,000			
North Carolina	1	65	Total	23	93,699

TABLE 104.—*Deferred projects—public buildings and public utilities.*

MISCELLANEOUS.

[Tabulated from replies to a questionnaire of the Division of Public Works and Construction Development.]

States.	Number of projects.	Value in thousands of dollars.	States.	Number of projects.	Value in thousands of dollars.
Alabama	1	15	Missouri	8	33,695
Arizona	4	1,060	Montana	1	20
Arkansas	1	300	New Jersey	9	2,265
California	7	2,175	New York	31	6,875
Colorado	7	1,300	North Carolina	2	390
Connecticut	10	4,910	North Dakota	1	100
Delaware	2	350	Ohio	15	5,115
District of Columbia	1	2,000	Oklahoma	4	350
Florida	1	100	Oregon	5	590
Georgia	4	9,190	Pennsylvania	22	5,350
Idaho	1	50	Rhode Island	2	910
Illinois	14	8,640	South Carolina	2	400
Indiana	2	40	South Dakota	2	500
Iowa	4	600	Tennessee	2	35
Kansas	5	120	Texas	1	1,000
Kentucky	3	120	Utah	9	1,290
Louisiana	31	7,295	Virginia	9	25,800
Maine	1	500	Washington	3	1,240
Maryland	4	1,083	West Virginia	3	110
Massachusetts	18	8,885	Wisconsin	11	9,950
Michigan	18	18,670			
Minnesota	8	680	Total	289	164,068

A questionnaire is seldom expected to bring out a full quota of replies. A glance at Tables 96 to 104 indicates that this questionnaire was no exception to the rule. The proportion of replies from public officials was evidently larger than that from architects and others interested in private construction projects. Indeed, the replies concerning private projects were so few that it was not thought worth while to classify them by States.

For example, the total number of deferred dwellings revealed by the questionaire was only 729 for the country as a whole, yet it is known that a single city of the first rank builds as many dwellings as that in a normal year.

It is to be noted, therefore, that the foregoing statistics, particularly those relating to private construction, evidently do not embrace all projects for which plans had been drawn but for which contracts

had not been let at the time of the armistice. Furthermore, even if they had embraced all such projects, they would not be in any sense an exact measure of the present need for building. However, with these considerations in mind, the deferred construction which they record at the time of the armistice is notably large.

Respectfully submitted.

(Signed) EDWIN J. CLAPP,
M. A. MIKKELSEN,
Directors,
WARREN CASE,
EVERETT DOMINICK,
THOMAS S. HOLDEN,
AUGUSTUS P. NORTON,
CATHERINE J. PAINE,
L. A. RUFENER,
JOHN WHYTE,
Staff Members, Economic Section;
Division of Public Works and Construction Development.

SELECTIVE BIBLIOGRAPHY.

This bibliography has been compiled with a view to acquainting architects, contractors, engineers, manufacturers of building materials, and others interested in the construction industry with some of the main sources of information concerning their industry. It has therefore been made selective and descriptive rather than exhaustive.

I. COST AND SUPPLY OF BUILDING MATERIALS.

I. General Information on Prices.

1. Wholesale Prices, Wages, and Transportation; report by Mr. Aldrich from the Committee on Finance, March 3, 1893. Senate Report No. 1394, forty-second Congress, Second Session, Part II. (Known as the Aldrich Report.)

   Gives price records on a large number of articles, extending, in some cases, as far back as the 1840's and up to the year 1893.

2. Gold, Prices, and Wages Under the Greenback Standard, by Dr. Wesley C. Mitchell (Berkeley, 1908).

   Covers the Civil War period and the reconstruction period following. The price tables used were taken from the Aldrich Report.

3. Equation of Exchange for 1916, by Irving Fisher. American Economic Review, December, 1917, p. 934.

4. Appraisals and Rate Making, by Cecil F. Elmes, of the Engineering Staff of Sanderson & Porter, Chicago.

   A paper read at the fifteenth annual meeting of the Illinois Gas Association, March 20, 1919. Discusses problems of valuation of public utilities and rate making brought about by the new price level. Gives curves of prices in England for six centuries on wheat, iron, lead, cattle, sheep; also, curves of artisans' wages for six centuries in England. A valuable contribution to the study of the 1919 price situation.

5. Prices During the War and the Readjustment Period, by T. S. Holden.

   Pamphlet issued by the United States Department of Labor, April, 1919. Summarizes briefly the price situation as affecting the building outlook for 1919.

6. Lumber and Its Uses, by R. S. Kellogg. Radford Architectural Co. Chicago, 1914.

   This is a study of the economic uses of lumber and lumber products. This was used as an exhibit before the Interstate Commerce Commission.

7. The Price Problem in the Lumber Industry, by Dr. Wilson Compton, American Economic Review, September, 1917.

II. Government Publications.

1. Bulletins of the Geological Survey.

   The Survey issues annually bulletins on the production of various mineral products. Of special interest in connection with building materials are those on stone, cement, lime, slate, sand, and gravel, and clay-working industries in the United States. The last-named also gives data on building operations in the United States.

   In each of these bulletins there is presented, in addition to production statistics, a general survey of the industry in question for the year, together with, in most cases, average prices of the product for the various years included in the production tables. Production statistics are given by regions, as well as by totals for the whole country. Statistics of imports and exports are given.

   On the whole, these bulletins contain a large mass of very valuable information.

II. GOVERNMENT PUBLICATIONS—Continued.

2. Bulletins of the United States Bureau of Labor Statistics.

Wholesale Prices. Issued annually.

Gives monthly quotations on 294 commodities, together with price indices, by groups and for all commodities, from the year 1890 to date. Contains a lumber and building materials group, with 27 commodities listed, together with price indices for the group.

Monthly Labor Review.

Gives indices for wholesale prices, by groups and for all commodities, together with statistics of retail prices of the commodities that make up the cost of living, statistics on wages, and other general information connected with labor subjects.

3. Federal Reserve Bulletin. Issued monthly.

Gives review of business conditions, reprinting price indices compiled by various statistical organizations.

4. Bulletins of the Price Section, War Industries Board.

These bulletins (57 in number) give quoted and relative prices on numerous commodities by months, by quarters, and by years, for the period 1913–1919. Of special interest in connection with building materials are the following:

No. 1. Summary.
No. 2. International Price Comparisons.
No. 3. Government Control Over Prices.
No. 6. Prices of Building Materials.
No. 33. Prices of Iron, Steel, and their Products.
No. 38. Prices of Clay Products.
No. 39. Prices of Sand and Gravel.
No. 40. Prices of Quarry Products.
No. 41. Prices of Cement.
No. 42. Prices of Glass.
No. 43. Prices of Lumber.
No. 44. Prices of Paints and Varnishes.
No. 51. Prices of Wood-Distillation Products and Naval Stores.

The Price Section of the War Industries Board has on file the wholesale market quotations by months from January, 1913, to December, 1918, on about one hundred grades of light hardware.

The Price Section has also issued a bulletin, Comparison of Prices During the Civil War and the Present War.

5. Bulletins of the United States Forest Service.

Some Economic Aspects of the Lumber Industry, by William S. Greeley, United States Forest Service Bulletin No. 114.

Treats of the organization, the value of lumber products and lumber costs, foreign trade, etc.

The Export Lumber Trade of the United States.

Handbook of suggestions for developing foreign commerce and study of the present needs and future possibilities of extending the lumber industry in foreign markets.

6. Bulletins of the War Trade Board.

Effect of War on the Glass Industry of the World. (With tables.)

Lumber Production, Plant Capacity, Labor Situation, etc., in the United States.

Steel: Production in European Countries Since 1913.

Lumber: Effect of War on the World Situation.

Iron and Steel Products: Exports to Allies, Neutrals, and Central Powers and to Active Belligerents, to Europe and to the World, 1912–1918.

7. Bulletins of the Federal Trade Commission.

Hemlock and Hardwood Lumber.

Cost accounting study.

Building Hardware.

Cost accounting study.

II. GOVERNMENT PUBLICATIONS—Continued.

8. Bulletins of the Tariff Commission.

The Glass Industry as Affected by the War.

127-page report. A comprehensive report covering production, consumption, imports, exports, wages of labor, and other data on all kinds of glass products. Data covers period through 1917.

9. Bulletin of the Census Bureau of the Department of Commerce.

Statistics of Iron and Steel Products.

The tables present, in detail, the quantities in the hands of manufacturers of specified iron and steel products, and also of dealers and manufacturers consuming iron and steel products.

III. PERIODICALS.

1. Dun's Review.

Gives weekly report of wholesale prices, in most cases for the New York market, on brick, cement, lathe, lime, shingles (cypress No. 1), lumber, hemlock, white pine, oak (plain), oak (white quartered), red poplar, white ash, beech, birch, chestnut, cypress, mahogany, maple, spruce, yellow pine, cherry, basswood. Also steel, rosin, tar, turpentine, linseed oil, paints.

Also publishes monthly index of wholesale prices for all commodities, but no index on building materials.

2. Bradstreet's.

Gives weekly report of wholesale prices, in most cases for New York market, on brick, lime, cement, wire nails, window glass, yellow pine (12 inches and under), timber (eastern spruce), timber (hemlock), linseed oil, rosin, turpentine, tar, steel products.

Gives index of wholesale prices covering 96 commodities. This includes an index for a building materials group, which, however, is not very comprehensive, only eight commodities being included.

3. The Iron Age. New York, The Iron Age Publishing Co. Weekly.

Gives weekly quotations and market reviews on iron, steel, and other metal products, and also production figures from time to time. Very complete and thoroughly reliable.

4. The Iron Age. Annual Review Number, January 2, 1919.

Gives a number of price series on iron and steel products, covering a period of 22 years.

5. The Iron Trade Review. Cleveland. The Penton Publishing Co. Weekly.

Gives weekly quotations on all iron and steel products, as well as prices on other metals. Also gives freight rates on ores and finished products, and production statistics from time to time.

6. The American Iron and Steel Institute, New York.

Compiles and publishes all kinds of statistical information concerning the iron and steel industries, and production, imports, and exports, etc.

7. Engineering News-Record. New York. The McGraw-Hill Co. (Inc.). Weekly.

Gives in the first issue of each month wholesale prices for a number of markets on iron and steel products, including metal lath and reinforcing bars, railroad ties, road and paving materials, sand, gravel, crushed stone, lime, cement, brick, hollow tile, drain and sewer pipe, prepared roofings, linseed oil, white and red lead, lumber, and contractors' miscellaneous supplies.

8. American Contractor. Chicago. The American Contractor Publishing Co. Weekly.

Contains weekly quotations for various markets on lumber, Portland cement, common brick, and iron and steel products.

9. Building Supply News. Chicago. Kenfield-Leach Co. Monthly.

Gives prices, delivered on the job, of 56 basic building materials for 72 markets.

10. Rock Products. Tradespress Publishing Corporation. Chicago. Published every other Wednesday.

Gives quotations for a number of markets on agricultural limestone, crushed stone, sand, and gravel. Publishes occasional statistical information on these products.

11. Oil, Paint, and Drug Reporter. New York. The Oil, Paint, and Drug Reporter (Inc.). Weekly.

Gives weekly quotations for New York market on all kinds of paint and varnish materials, including oils, gums, pigments, naval stores, etc. Also gives quotations on window glass.

III. PERIODICALS—Continued.

12. Oil, Paint, and Drug Reporter, 1918 Yearbook. Oil, Paint, and Drug Reporter (Inc.).
"A complete tabular presentation of production, distribution, prices of commodities, imports and exports, in the Reporter markets with abstracts of legislation affecting the same, together with price comparisons since the beginning of the war, August, 1914, to December, 1918, inclusive; as well as related matter having to do with the changes incident to the conduct of business in war time and the development of new industries to meet war-time demands, with special analyses of the movement of the more important commodities, and a general résumé of all markets which the Reporter represents."

13. Lumber. Manufacturers and Dealers Edition. The Journal of Commerce Co. St. Louis, Mo.
Quotations on lumber.

14. American Lumberman. Chicago, Ill. Weekly.
Gives review of current market conditions. Current prices.

15. Southern Lumberman. Published weekly.
Editorial comment on market conditions. Market reports.

16. Commercial Bulletin. Boston.
Quotations on lumber from the Boston market.

17. Other journals giving prices are:
On Paints, Naval Stores, etc.—
American Paint Journal.
Journal of Commerce.
Naval Stores Review.
Drugs, Oils, and Paints.
On Iron and Steel Products—
Hardware Age.
Journal of Commerce.
American Machinist.
Waste Trade Journal.

II. LABOR AND WAGES IN THE CONSTRUCTION INDUSTRY.

THE BUREAU OF LABOR STATISTICS.

1. The Bureau of Labor Statistics is the nucleus around which the Department of Labor itself has been built up. Its present functions are almost wholly statistical and educational.

The Monthly Labor Review.—The Monthly Labor Review, formerly The Monthly Review, begun in July, 1915, is the principal publication of the bureau. In the three years of its existence it has come to be recognized as the authoritative publication dealing with matters of current interest relating to industry. It gives information concerning the current work of the Bureau of Labor Statistics and of other bureaus of the Department of Labor, and also the work of other Government agencies dealing directly with labor matters. Special articles and brief reports of original investigations appear in its issues. Statements of the employment and conciliation work of the department and statistics on immigration are printed each month. Reviews of the work of State labor bureaus, workmen's compensation commissions, minimum wage commissions, and arbitration boards are given, together with information concerning the legislation of Congress and of the several States, and summaries and analyses of important court decisions relating to labor. Retail and wholesale prices of commodities appear each month, and various phases of the labor situation in this and foreign countries as affected by the war are considered in detail. Up-to-date information as to the various Government war boards and

THE BUREAU OF LABOR STATISTICS—Continued.

bureaus dealing with labor matters and their personnel and work is published each month.

"Frequent reference is made to the annual and biennial reports of the various state Departments of Labor. Copies of all State reports are on file in the library of the United States Department of Labor. In addition, the Bureau of Labor Statistics receives many unpublished State reports which appear in the Monthly Labor Review published by the Bureau. For this reason the Bureau of Labor Statistics is frequently given as the source of statistical information which has its origin in the various State departments.

"When statistical reports are issued periodically by any agency, the data in the last report has been listed. Special Reports of the Federal Government running back to 1910 are listed but special State reports are not included."

A LIST OF LABOR STATISTICS ISSUED BY THE STATISTICAL CLEARING HOUSE, CENTRAL BUREAU OF PLANNING AND STATISTICS.

2. This bibliography contains material under the following headings:

Accident Compensation and Insurance.	Labor Costs.
Accidents.	Labor Demand and Supply.
Cost of Living.	Labor Organizations.
Disputes and Settlements.	Occupational Diseases.
Employment.	Productivity of Labor.
Employment Agencies.	Unemployment.
Factory Inspection.	Vocational Education.
Hours of Labor.	Wages.
Housing.	Welfare Work.

3. *Wages.* Fifteenth Annual Report of the United States Commissioner of Labor. Wages and Hours of Labor from 18— to 1900. Washington.

"In order to answer the very numerous demands for information relative to the rates of wages, hours of labor, etc., the department undertook, nearly seven years ago, the compilation of such information for the commercial countries of the world * * * The present compilation includes the lowest, highest, and average rates of wages per day and hours per week for the United States, and the lowest and highest rates and hours for foreign countries. It gives quotations for each country as far back as any definite official statement was to be found, and the quotations come down to the present year (1900)."—*Carroll D. Wright.*

4. ———. Nineteenth Annual Report of the United States Commissioner of Labor, 1904. Wages and Hours of Labor, 1890 to 1903.

"The present volume, the Nineteenth Annual report of the Bureau of Labor, presents the results of an extensive investigation into the wages and hours of labor in the leading manufacturing and mechanical industries of the United States during the period from 1890 to 1903, inclusive."

5. United States Department of Labor, Bureau of Labor Statistics—
   (*a*) Bulletin 131. Union scale of wages and hours of labor for 1907–1912.
   (*b*) Bulletin 143. Union scale of wages and hours of labor for 1913.
   (*c*) Bulletin 171. Same for 1914.
   (*d*) Bulletin 194. Same for 1915.
   (*e*) Bulletin 214. Same for 1916.

6. The scale of wages for 1917 has not yet been published. The Monthly Labor Review for September, October, and November, 1918, give the union scale of wages and hours of labor for 1918. The scale of wages and hours of labor for the years 1904 to 1906, inclusive, are not available.

7. *Employees and Wages. Washington, 1903.*

Special report made for the Twelfth Census under the direction of Prof. Davis R. Dewey, and known as the Dewey Report. It is a comprehensive study of classified wage rates for the years 1890 and 1900. Does not contain wage rates of building tradesmen; "the inquiry was limited to 31 industries, nearly all of a permanent character, which are not violently affected by seasonal influences."

A LIST OF LABOR STATISTICS, ETC.—Continued.

8. The minimum scale of wages in the building trades on the eight-hour basis is also contained in the annual reports of the proceedings of the Building Trades Department of the American Federation of Labor. The report for 1918 contained, for example, the minimum scale in 114 different cities.

9. Wages and the War, a summary of recent wage movements, by Hugh S. Hanna and W. Jett Lauck. Cleveland, Ohio, 1918.

Contains a mass of material on wages in various trades for the years 1911–1917; in some trades the year 1907 is added. It contains numerous charts and tables showing the per cent of increase of rates prevailing in December, 1917, over 1914 and over 1911.

Pages 35–47 contain the rate of increase of building wage rates prevailing December, 1917, over those prevailing in 1914 and 1911.

Pages 159–222 contain the union rates of pay in the building trades in large cities, 1907–1917.

COST OF LIVING.

10 (*a*). The Bureau of Labor Statistics gathers data on the cost of living which it publishes in the Monthly Labor Review. Increases in the cost of living from December, 1914, for shipbuilding districts are contained in this Review. The increases for many other cities are also published in it.

Under the caption, Prices and the Cost of Living, this bureau publishes each month comprehensive data. The December, 1918, issue of the Monthly Labor Review, for example, contains the following material:

Prices and cost of living—

Retail prices of food in the United States.
Retail prices of dry goods in the United States.
Price changes, wholesale and retail, in the United States.
Index numbers of wholesale prices in the United States, 1913 to October, 1918.
Changes in wholesale prices in the United States.
Wholesale prices in the United States and foreign countries, 1890 to September, 1918.
Consumption of food in shipbuilding districts.
Index numbers of wholesale prices published by the Federal Reserve Board.
New cost of living regulations in Canada.
Food prices in Great Britain.
Increase in the cost of living in Sweden from 1914 to the end of July, 1918.

(*b*). Cost of Living and the War, an analysis of recent changes, by W. Jett Lauck. Cleveland, Ohio, 1918.

"This volume is a summarization and analysis of official and authoritative data bearing upon the cost of living, with special reference to the families of wage earners." It contains also a bibliography of publications on the cost of living.

(*c*). The Possibility of Compiling a Cost of Living Index, by Royal Meeker, United States Commissioner of Labor Statistics. Monthly Labor Review, March, 1919.

This article is an analysis of the questions connected with the compilation of the cost of living index. The plans of the Bureau of Labor Statistics for perfecting and completing the cost of living surveys are described by Commissioner Meeker.

(*d*). The National Industrial Conference Board, a cooperative body composed of representatives of national and industrial associations, publishes in Boston reports on changes in the cost of living. It published two reports on the war-time changes in the cost of living; one in August, 1918, and the other in February, 1919.

11. Building Tradesmen, whose organization in 1918 comprised 635,380 members, record their activities in the annual reports of the Building Trades Department of the American Federation of Labor. These reports contain a list of officers of the Building Trades Department, its constitution, the decisions with regard to jurisdictional disputes, the proceedings of the annual conventions, reports of officers and statistics with regard to membership and annual wage scales.

III. SOURCE AND SUPPLY OF CAPITAL FOR THE CONSTRUCTION INDUSTRY.

I. Government Publications.

1. Annual reports of the Comptroller of the Currency. Government Printing Office, Washington, D. C.

   These reports contain statistics of the resources of banks of all classes and of trust companies of the United States, including the amount of loans secured by real estate and mortgages owned. The value of these reports in respect to real estate loans is diminished by the fact that since 1916, the statistics of real estate loans are not comparable with the earlier figures. Up to 1916, the Comptroller of the Currency compiled real estate loan statistics from individual reports of the different classes of banks of the country. Since 1916, the comptroller has received individual reports only from national banks and has compiled the statistics for other classes of banks from the State banking reports. Inasmuch as all the State banking reports do not segregate real estate loans from other bank resources, any compilation of real estate loans based on State banking reports will be incomplete.

2. Reports of State Banking Departments.

   The banking departments of the different States issue annual reports on banking institutions reporting to them. These reports are of uneven quality. The most useful of the State banking department reports are those of New York. They contain considerable information on real estate loans of New York banking institutions under State control and these represent about one-sixth of the banking resources of the United States.

3. Annual Reports of the Federal Farm Loan Board. Government Printing Office.

   These reports contain valuable information on the working of the Federal Land Bank System.

4. The Federal Farm Loan Act. Sixty-fourth Congress. First Session. Senate Document 500.

   This document is of particular interest since the Federal Farm Loan Act is the model of the proposed Home Loan Bank Act.

5. Hearings before the subcommittee of the Joint Committee on Rural Credits. Sixty-fourth Congress, First Session.

   These hearings contain a mass of information relating to mortgage loans, relating more particularly, of course, to rural mortgage loans.

6. The National Bank Act as amended, the Federal Reserve Act, and other laws relating to national banks, Sixty-fourth Congress, First Session. Document 412.

7. The Federal Reserve Bulletin issued monthly by the Federal Reserve Board, Washington.

   This bulletin contains much very valuable information on the general financial conditions of the country and in particular on the rate of interest.

II. Books.

1. W. H. Kniffin, jr., The Savings Bank and its Practical Work.

   This book contains considerable information on real estate loans of savings banks and how they are managed.

2. Edward D. Jones, Investment.

   This book contains some valuable material on mortgage loans as investments, including a detailed analysis of 41 considerations which the assessors of Philadelphia are asked to take into account in making valuations.

3. Hardy and Lindner, Insurance and Real Estate.

4. Frank A. Fetter, Moden Economic Problems.

   This book contains a compact and useful account of building and loan associations relating particularly to their methods (pp. 156–161).

5. Loans and Discounts: Shaw Banking Series.

   Among other material on real estate loans, this book contains a description of a plan of bank loans to home builders, providing for repayment on the installment plan (p. 233).

6. S. S. Huebner, Life Insurance.

   This book contains information on mortgage loans as investments of life insurance companies.

III. Miscellaneous References.

1. Proceedings of the Annual Convention of the United States League of Local Building and Loan Associations. American Building Association News, Cincinnati, Ohio.

In addition to much other useful matter on building and loan associations, these proceedings contain statistics on the real estate loans made during each year and on the total assets held by building and loan associations in the United States.

2. The Insurance Yearbook, Spectator Co., New York.

This yearbook contains voluminous statistics on life insurance companies in the United States, including an itemized list of the assets of all of the leading companies.

3. Annual financial statements of the various life insurance companies.

These small pamphlets may be had annually upon application to the different life insurance companies. Most of them give the amount of mortgage loans in the itemized list of assets. These little statements are available before the same information is published in the Insurance Yearbook.

4. K. V. Haymaker, Home Building and Citizenship. Address delivered at Detroit, Mich., and published by the American Building Association News, Cincinnati, Ohio, in pamphlet form in 1918.

Contains a short description of building and loan association methods.

5. Tentative Draft of a Bill to Promote Home Building, Issued by the United States Department of Labor, Division of Public Works and Construction Development.

This bill if passed by Congress will provide a system of Federal Home Loan Banks modeled upon the Federal Land Bank system.

6. Home Loan Banks Urged to Stimulate Building Operations. Annalist, February 3, 1919.

This article in the Annalist advocated a new law to enable an increase of mortgage credit that the treasuries of building and loan associations depleted by investments in Government bonds might be replenished to meet the demands of peace reconstruction.

7. Real Estate Record and Builders' Guide has occasional articles on real estate loans. The following may be noted as of particular interest.
   (*a*) A Discussion pro and con of the Torrens Land Title Law as it operates in New York. In the issue of May 18, 1919.
   (*b*) A detailed account of the official procedure under the Torrens Law by James A. Donegan, registrar of New York County in the issue of June 1, 1918.
   (*c*) A discussion of the Gilchrist Bill which provides that trust bonds in New York may be invested in parts of mortgages held by title and guaranty companies. In the issue of May 11, 1918.
8. The American Bankers' Association has gathered by means of a questionnaire and by other methods a considerable mass of information on amortization of real estate loans. This is available at the office of the American Bankers' Association, 5 Nassau Street, New York City.
9. The Department of Agriculture has received returns on a questionnaire relating to real estate loans addressed to about 28,000 banks and will soon publish the results.
10. The American Bankers' Magazine, contains occasional items of interest relating to real estate loans.
11. Annual proceedings of the National Bankers' Association. These proceedings contain discussions of real estate loans and other related topics.

IV. BUILDING AND PUBLIC WORKS.

A. Statistics on Building Operations.

1. Statistics of building and engineering contracts awarded.

(a) The American Contractor. F. W. Dodge Co., New York.

Engineering contracts awarded in the territory east of the Missouri and north of the Ohio Rivers have been published in this periodical since January 1, 1910. They are also given for each of six districts into which this territory is divided. The statistics for the New England district have been compiled since 1901.

2. Statistics of building permits.

(a) Clay-working Industries in the United States and Building Operations in the Larger Cities. United States Geological Survey, Department of the Interior.

This publication is a chapter of the volume Mineral Resources of the United States. It is the only official publication of building permits statistics. About 144 cities are included in the reports, being roughly those over 35,000 population. The number varies slightly from year to year on account of the failure of some cities to make a complete report. Mr. Jefferson Middleton, of the Geological Survey, has had charge of this compilation for a number of years.

(b) Private agencies. The American Contractor, Dun's, Bradstreet's, and other agencies also compile information of this character.

B. Current Building Operations.

1. Notes as to projects contemplated and contracts awarded for building.

(a) Trade magazines.

A number of trade magazines, among which are the American Contractor, the Architectural Record, and the Real Estate Record and Guide, all published by the F. W. Dodge Co., of New York; The American Architect, published by the Architect and Building Press, Inc., New York; the Manufacturers Record, Baltimore; the Engineering News Record, New York, and the Municipal Journal, New York, have departments in which up-to-date information is given as to work in the hands of architects and engineers, bids called for, and contracts awarded.

C. Public Works.

1. Census reports.

(a) Financial statistics of cities. United States Census Bureau of the Department of Commerce.

(b) Financial statistics of States. United States Census Bureau of the Department of Commerce.

These annual publications give, among other things, the "outlay" for cities of more than 30,000 population and for all States. Outlay means, in this connection, expenditures that add to the assets of the city or State concerned, repairs and replacements not being included.

2. Reports of heads of executive departments.

(a) Report of Secretary of State.
(b) Report of Secretary of Treasury.
(c) Report of Secretary of War.
(d) Report of Secretary of Navy.
(e) Report of Attorney General.
(f) Report of Postmaster General.
(g) Report of Secretary of Agriculture.
(h) Report of Secretary of the Interior.
(i) Report of Secretary of Commerce.
(j) Report of Secretary of Labor.

The reports of the Cabinet members include reports to them from the chiefs of bureaus and other services. Many of these subdivisions, as, for example, the Supervising Architect's office in the Treasury Department, the Engineering Division and the Construction Division in the War Department, the Bureau of Yards and Docks in the Navy Department, the Bureau of

C. PUBLIC WORKS—Continued.

2. Reports of heads of executive departments—Continued.

Public Roads and Rural Engineering in the Department of Agriculture, the Reclamation Service and the Bureau of Indian Affairs in the Department of the Interior, the Lighthouse Service and the Life Saving Service in the Department of Commerce, and, since organized, the United States Housing Corporation in the Department of Labor, all have a considerable amount of construction in their charge, and their respective reports give information as to what is being done in this line by the Federal Government.

V. HOUSING.

A selected bibliography of industrial housing during and after the war in America and Great Britain has been prepared for the United States Housing Corporation by Miss Theodora Kimball, consulting librarian for the United States Housing Corporation, under the direction of Dr. James Ford, manager of the Homes Registration and Information Division.

It contains a selection of 250 of the more important references from 1,000 or more books, articles, and pamphlets issued on this subject during the period of the war and made up of the following sections:

GENERAL.

HOUSING AGENCIES:

Government: Federal—State and Municipal.

Private Capital: Industrial Corporations—Cooperative Societies.

WAR EMERGENCY PROBLEMS: Labor and Housing, Labor Turnover—Real Estate Acquisition and Commandeering, Requisitioning, and Billeting—Registration Bureaus and Room Renting—Landlord and Tenant Relations, Rent Profiteering—Transportation.

PLANNING AND DEVELOPMENT OF HOUSING SCHEMES: General—Technical Methods of United States Government Designers—Housing Standards—Types of Community Development—Construction of Housing Schemes.

HOUSES: HOUSE TYPES AND TYPES OF CONSTRUCTION: House Types—Building Materials and Types of Construction.

HOME OWNERSHIP AND MANAGEMENT PROBLEMS: Home Ownership—Renting and Management—Special Community Facilities.

HOUSING FINANCE: General—Governmental Aid.

LAND VALUES AND TAXATION.

Brief comments are submitted with the more important articles.

INDEX.

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